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PROCEEDINGS: CONFERENCE IN THE MATTER OF POLLUTION OF LAKE ERIE AND ITS TRIBUTARIES, HELD AT BUFFALO ON AUGUST 10-11, 1965. VOLUME I

Federal Water Pollution Control Administration
Washington, D. C.

August 1965

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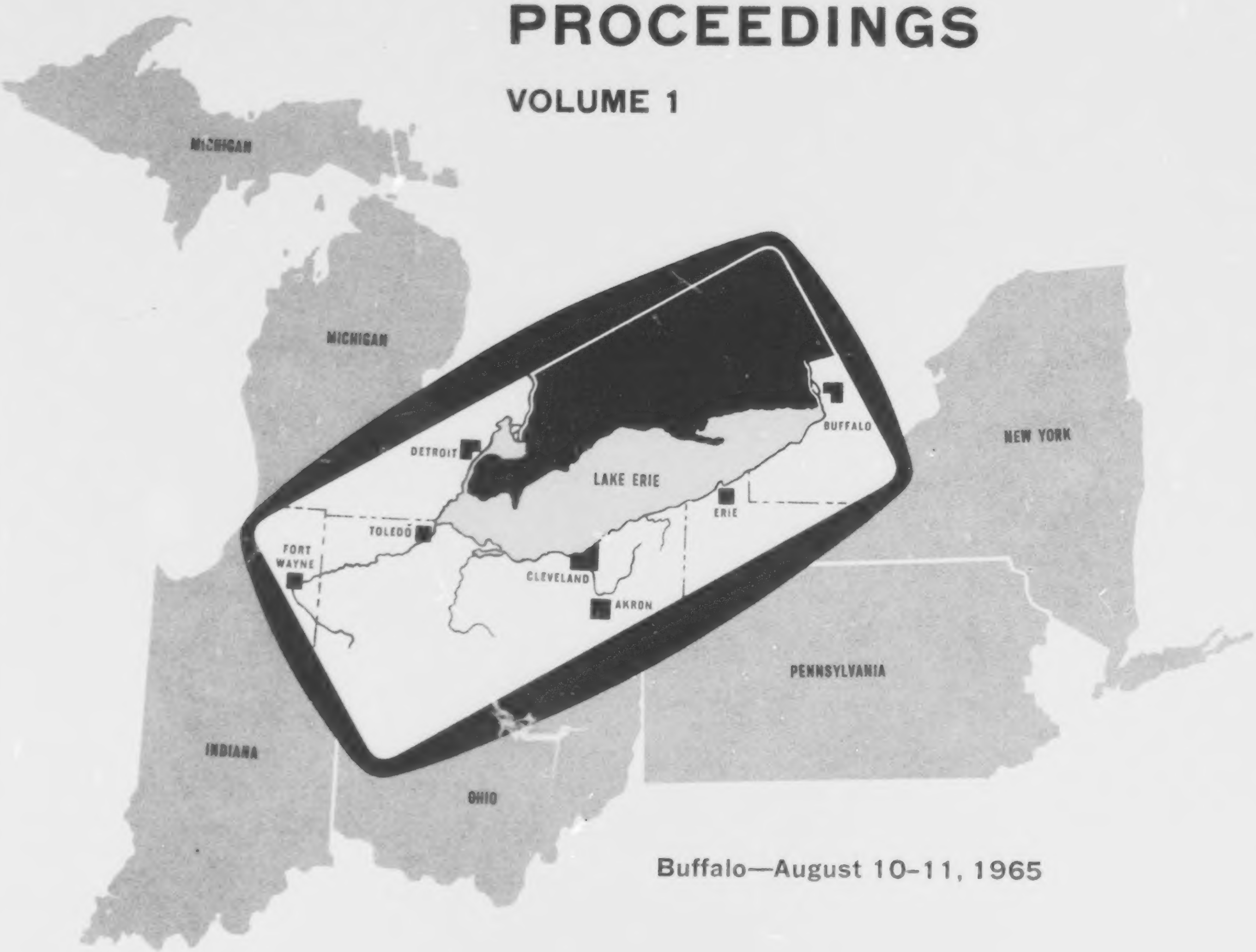

Buffalo—August 10-11, 1965

Conference

In the matter of Pollution of Lake Erie and its Tributaries

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FEDERAL WATER POLLUTION CONTROL ADMINISTRATION

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FEDERAL WATER POLLUTION CONTROL ADMINISTRATION

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In re:

ENFORCEMENT CONFERENCE ON THE

INTERSTATE AND OHIO INTRASTATE

WATERS OF LAKE ERIE AND ITS

TRIBUTARIES

* * * * * * * * * * * * * * * * *

Statler-Hilton Hotel
Buffalo, New York
Tuesday, August 10, 1965

The above-entitled matter, pursuant to notice, at 9:30 a.m.

MURRAY STEIN, Chairman

CONFEREES:

Loring F. Oeming, Executive Secretary, Michigan Water Resources Commission, Lansing, Michigan
Blucher A. Poole, Technical Secretary, Indiana Stream Pollution Control Board, Indianapolis, Indiana
Emmett W. Arnold, M.D., Chairman, Ohio Water Pollution Control Board, Ohio Department of Health, Columbus, Ohio
Fred E. Morr, Director of Natural Resources, State of Ohio, Columbus, Ohio
Charles L. Wilbar, Jr., M.D., Chairman, Pennsylvania Sanitary Water Board, Pennsylvania Department of Health, Harrisburg, Pennsylvania
Richard M. Boardman, Chief, Stream Quality Section, Pennsylvania Department of Health, Harrisburg, Pennsylvania
Hollis S. Ingraham, M.D., Commissioner of Health, New York State Department of Health, Albany, New York
Robert D. Hennigan, Director, Bureau of Water Resource Services, New York State Department of Health, Albany, New York
H. W. Poston, United States Department of Health, Education, and Welfare, Regional Program Director, Region V, Chicago, Illinois

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THOSE IN ATTENDANCE:

Seth A. Abbott, Supervisor, Town of Hamburg, Hamburg, New York

Mark Abelson, Regional Coordinator, U. S. Department of the Interior, Boston, Massachusetts

Edward G. Airey, Hamburg, New York

George R. Amery, Sr. Engineer, E. I. duPont deNemours & Co., Niagara Falls, New York

Earl J. Anderson, Regional Program Director, Department of Health, Education, and Welfare, New York, New York

Mrs. James Ballard, Vice President, League of Women Voters, Clarence, Williamsville 21, New York

Charles L. Barber, Chemist, Wanakah Water Co., Wanakan, New York

Rachel G. Barre, Reporter, Dunkirk Observer, Silver Creek, New York

William J. Barrett, Citizen, Buffalo 14, New York

Walter Baumgart, Buffalo, New York

Edward D. Baxter, Commission of Public Works, City of Buffalo, Buffalo, New York 14202

Edwin T. Bean, Jr., Vice President, Wanakah Water Company, Hamburg, New York

Mrs. Edward Becker, Christian Family Movement, Buffalo, New York

Dr. Theda Bennett, Professor, NYS University Coll. League of Women Voters, Buffalo, New York

Honorable Roland R. Benzow, Councilman, Minority Leader, City of Buffalo, Buffalo, New York

Carl J. Bernhardt, Regional Director - Eng., N.Y. State Department of Health, Buffalo 2, New York

L. F. Birkel, Engr., Republic Steel Corp., Cleveland, Ohio

Mrs. Folmar Bjerre, President, League of Women Voters, Hamburg, New York

Hayse H. Black, U. S. Department of Health, Education, and Welfare, Cincinnati 26, Ohio

Mrs. Peter J. Boldenow, League of Women Voters of Hamburg, New York, North Boston, New York

George T. Booth, Jr., President, Buffalo Waste Oil Service, North Tonawanda, New York

Edmund M. Borowski, Chemist, Water Department, City of Dunkirk, Dunkirk, New York 14048

A. D. Boswell, Project Engineer, Union Carbide Corp., Niagara Falls, New York

James J. Bowen, Sanitary Engineer, Erie County Department of Public Works, Buffalo, New York

Allan P. Bradley, Executive Assistant to Commissioner of Education, New York State Education Department, Albany 1, N.Y.

Bill Branche, Reporter, Niagara Falls Gazette, Niagara Falls, New York

A. D. Brandt, Manager, Industrial Health Engineering, Bethlehem Steel Co., Bethlehem, Pennsylvania

John D. Bridge, Attorney, Niagara Mohawk Power Corp., Buffalo, New York

Dave Brigham, National Director, New York State Jaycees, Buffalo, New York

Lewis Brooke, Oper. Supt., Mobil Oil Co., Baffalo, New York

Earl W. Brydges, Minority Leader N.Y.S. Senate, Niagara Falls, New York

Charles G. Bueztman, Technical Director, Soap & Detergent Association, New York City 17, New York

Paul G. Bulger, President, State University College, Buffalo, New York

John Henry Bunz, Chairman, Clean Streams Comm., Tonawanda Sportsmans Club Inc., N. Tonawanda, New York

Frank A. Butrico, Dir. Envir. Health Science Programs, Battelle Memorial Institute, Washington, D. C. 20036

W. R. Cady, Technical Assistant, Allied Chemical - Solvay Process, Detroit, Michigan

Donald J. Casey, Oceanographer, U.S. Department of Health, Education, and Welfare, Rochester, New York

Victor L. Casper, Aquatic Biologist, U.S. Department of Health, Education, and Welfare, Cleveland, Ohio

A. L. Chamberlain, Executive Director, N.Y. State County Officers Assn., Albany, New York

Mrs. Roy H. Clark, Conservation Chairman, 8th District Federated Garden Clubs, and YWCA and AAUW, Kenmore, N.Y.

Theodore P. Clista, Sanitary Engineer, Pennsylvania Department of Health, Meadville, Pennsylvania

Nicholas S. Colello, Director of Development, City of Lackawanna, Lackawanna, New York

William F. Cooke, Supervisor of Laboratories, Mobil Oil Co., Inc., Buffalo, New York

Robert E. Copeland, Project Devel. Eng., O'Brien & Gere Consulting Eg., Syracuse, New York

Mrs. Edward K. Crook, Member of Lake Erie Basin Comm., League of Women Voters, Holland, New York

Edward Cuddy, Assoc. Prof., Tonawanda, New York

Paul Cygan, Chief, Bureau of Sewers, Erie, Pennsylvania

Mrs. Ormus W. Davenport, President, Buffalo Federation of Women's Clubs, Buffalo, New York

Kernan W. Davis, Geologist, West Falls, New York 14170

Stanley C. Davis, Western Region Director, New York State Petroleum Council, Buffalo, New York

Robert V. Day, Chief, Planning & Reports, Department of Health, Education, and Welfare, Cleveland, Ohio

Lee Dickinson, Fuel Engineer, Bethlehem Steel Co., Lackawanna, New York

Walter R. Dobay, Guard, State University College, Buffalo, New York

John H. Doerr, Senator - State New York, Buffalo, New York

Albert W. Dold, Mgr - Ind. Rel. & Bus. Serv., Buffalo Area Chamber of Commerce, Buffalo, New York

H. E. Dosbert, Buffalo 2, New York

Carol Ann Dros, Student, Bishop Colton, Buffalo, New York

John Duren, Waste Treatment Sales Engineer, Dow Chemical Co., Buffalo, New York

Miss Dorothea C. Duttweiler, Conservation Consultant, Federated Garden Club of N.Y. State, Holland, New York 14080

Leonard B. Dworsky, Director, Cornell University Water Resources Center, Ithaca, New York

George H. Eagle, Chief Engineer, Ohio Department of Health, Columbus, Ohio 43216

Harold B. Ehrlich, Executive Director, Niagara Frontier Port Authority, Buffalo, New York

William R. Elsea, M.D., Deputy Commissioner, Erie County Health Department, Buffalo, New York

William T. Evans, Executive Vice President, Wanakah Water Co., Hamburg, New York

Leonard J. Facciani, Director of Environmental Health, Chautauqua County Health Department, Mayville, New York

Richard Farnham, Plant Foreman, Town of Tonawanda Sewerage Department, Tonawanda, New York

Marvin B. Fast, Prog. Operations Officer, Department of Health, Education, and Welfare, Ann Arbor, Michigan

Mrs. Fred H. Federlein, League of Women Voters, Lewiston, New York

Marilyn Fiegel, Educator, Conservation Forum, Buffalo 15, New York

Robert B. Filbert, Jr., Assoc. Mgr., Chem. Engrg., Battelle Memorial Inst., Columbus, Ohio 43201

Edward J. Fox, Director, Locksley Park Taxpayers Association Inc., Hamburg, New York

Wm. M. Friedman, Chief, Bur. Special Services, Erie County Health Department, Buffalo 2, New York

Carolyn A. Gazdik, Department of Health, Education, and Welfare, Cleveland, Ohio 44130

Edward V. Geisman, Chief Enforcement Officer, Department of Health, Education, and Welfare, New York, N. Y.

Edwin E. Geldreich, Bacteriologist, Taft Center, Cincinnati, Ohio 45226

Col. L. J. Goodsell, Executive Director, Great Lakes Commission, Ann Arbor, Michigan

Helen Gordon, Citizen, Buffalo, New York 14213

J. A. Gouck, Supervisor - Effluent Control, National Aniline Div., Buffalo, New York

Mrs. J. Barrie Graham, Citizen, Hamburg, New York 14075

Keith Graham, Wellesley College, Wellesley, Massachusetts

M. E. Graham, Vice President-General Counsel, Hammermill Paper Co., Erie, Pennsylvania

Leo Grandy, Sr., Citizen, Buffalo, New York

Larry W. Griffis, Jr., Asst. R.D. McCarthy, M.C., Buffalo, New York 14213

Alvin Grossman, Rochester, New York

Ben J. Gryctko, Federal Water Pollution Control Advisory Board, Department of Health, Education, and Welfare, Washington, D.C.

T. L. Haberkorn, Manager, Quality Control & Prof., F & M Schaefer Brewing Co., Buffalo, New York 14213

M. H. Abrams, Walton League, Buffalo, New York

Chester Halgas, Public Health Engr., Cattaraugus Co., Olean, New York

Fred T. Hall, Director, Buffalo Museum of Science, Buffalo, New York 14211

Arthur Handley, Assoc. San. Eng., NYS Dept. Health, Albany, New York

John E. Harney, Wildlife Biologist, Bur. of Sport Fisheries & Wildlife, Concord, New Hampshire 03301

Robert P. Hartley, Oceanographer, Department of Health, Education, and Welfare, Cleveland 30, Ohio

Richard R. Harvey, Electro-Refracturies, Buffalo, New York

Charles J. Hauser, Treasurer, Niagara Frontier Port Authority, Buffalo, New York

Paul Hawkins, Student, West Seneca Central School, Buffalo, New York

William Henrich, Citizen, Buffalo, New York 14226

Gene A. Heuser, Diver, Erie, Pennsylvania

Rand Hickey, Business Consultant, New York State Department of Commerce, Buffalo, New York

Mrs. Stanley Higgins, Citizen, Lake Erie Basin Committee, League of Women Voters, Orchard Park, New York 14127

William O. Hill, Jr., County Commissioner, Erie County, Erie, Pennsylvania

Lt. C. R. Hinrichs, Group Commander Buffalo, United States Coast Guard, Buffalo, New York

Benjamin J. Hoey IV, Campaign Manager, Ben Hoey, Cheektowaya, New York

Mrs. J. H. Hollands, Taxpayer, Buffalo, New York

J. B. Holleyman, Liaison Meteorologist, GLIRBP - Weather Bureau, Department of Health, Education, and Welfare, Chicago, Illinois

Vincent H. Hourigan, Chief Operations Div., U.S. Army Corps of Engineers, Buffalo, New York

Daniel Idzik, Counsel - Senator Glinski, Buffalo 23, New York

Hollis Ingraham, M.D., State Health Commissioner, New York State Department of Health, Albany, New York

Burr C. Jackson, Citizen, Buffalo, New York

Richard M. Jordan, District Manager, Calgon Corp., Tonawanda, New York

Paul H. Joslin, Research Assistant, University of Rochester, Rochester, New York 14627

Felix L. Katzmarck, President, Forest District Civic Association, Buffalo 7, New York

John A. Kehoe, Engineer, Kimberly Clark Corp., Niagara Falls, New York

Henry W. Keitzel, Forum Chairman, Buffalo Sewer Authority, Izaak Walton League, Buffalo, New York

Thomas F. Kelleher, Program Planning Officer, Department of Health, Education, and Welfare, Washington, D. C.

Honorable Robert F. Kennedy, United States Senate, Washington, D. C.

James L. Kerwin, Reporter, Detroit News, Detroit 31, Michigan

Robert L. Ketter, Head, Dept. of Civil Engng., St. Univ. of N.Y. Buffalo, Buffalo, New York

E. H. Killheffer, Gen. Sales Mgr., The Dow Chemical Co., Buffalo, New York

Mrs. Margie King, Secretary, Citizen's Committee, Silver Creek, New York

Roy King, President, Citizen's Committee, Silver Creek, New York

Norbert H. Kirchgessner, Production Supt., Hooker Chemical Corp., N. Tonawanda, New York

F. W. Kittrell, Chief, Pollution Evaluation, Department of Health, Education, and Welfare, Cincinnati, Ohio

Betty Klaric, Cleveland Press Reporter, Cleveland, Ohio

K. L. Kollar, Director, Water Industries & Engineering Services, Department of Commerce, Silver Spring, Maryland

Mrs. Stanley Kresses, Operation Petticoat Progress, Niagara Falls, New York

Richard A. Kressin, Associate Chemist, Buffalo Sewer Authority, Buffalo, New York

Victor Kupenas, Citizen, Buffalo, New York

Albert M. LaSala, Jr., Geologist, U.S. Geological Survey, Hamburg, New York

John J. Lauchert, President, Hamburg Jaycees, Hamburg, New York

Mrs. Joseph Laufer, League of Women Voters, Buffalo, New York 14222

James J. Linosey, Regional Supvr. of Fish & Game, N.Y.S. Cons. Dept, Olean, New York

Mrs. George F. Little, CFM, Buffalo 15, New York

Vincent P. Locey, Chemist - Sewage Dept., City of Niagara Falls, Niagara Falls, New York

Mary Ann Lucki, Student, D'Youville College, Buffalo, New York

Kenneth M. Mackenthun, Aquatic Biologist, U.S. PHS, Cincinnati, Ohio

Gloria A. Mahoney, Operation Petticoat Progress, Niagara Falls, New York

Cdr. Francis J. Mann, USCG, Captain of The Port, Buffalo, U.S. Coast Guard, Buffalo, New York 14203

Joseph A. Marino, President, Lockslay Park Taxpayers Assn. Inc., Hamburg, New York

Frank J. Mathews, City Engineer, City of Lackawanna, New York State

James O. McDonald, U.S.P.H.S., Chicago, Illinois

John C. McMahon, Regional Engineer, NYS Conservation Dept., Div. of Water Resources, West Seneca, New York 14224

William S. Meeks, Asst. News Director, WBEN-TV, Buffalo, New York 14207

Claude H. Messengis, Refinery Superintendent, Ashland Oil (Buffalo Plant), Tonawanda, New York

Mrs. John Meyers, Member - Citizen, Bertie Boat Club, Point Ahino, Ontario, Canada

Howard W. Michaelis, Chemist (Retired), Conservation of Natural Resources, Buffalo, New York 14207

Raymond W. Michaels, Grand Island, New York 14072

Harold D. Mitchell, Director, Izaak Walton League, Williamsville, New York

R. W. Montonari, Asst. Commissioner, Albany, New York

Mrs. Howard T. Moore, Chm., Lake Erie Basin Committee, League of Women Voters, Chardon, Ohio 44024

Lawrence R. Moriarty, Director, Division of San. Health, Erie Co. Dept., Erie, Pennsylvania

Fred E. Morr, Director, Ohio Dept. Natural Resources, State of Ohio, Columbus, Ohio

Louise L. Morris, Buffalo, New York

William E. Mosher, Erie Co. Health Dept., Buffalo, New York

H. S. Mount, Asst. Mgr. Genl. Marketing Order Dept., Sun Oil Co., Philadelphia, Pennsylvania

Frank Mrozak, Foreman, Town of Tonawanda, Kenmore, New York

Thomas A. Mulhern, U.S. Public Health Service, Cleveland 30, Ohio

Henry Nagel, Eggertsville, New York

Colonel R. W. Neff, District Engineer, USA Engr. Dist., Buffalo, New York

Hugh Nevins, Chief Chemist, Town of Tonawanda Water Plant, Tonawanda, New York

Mrs. Robert North, Jr., League of Women Voters, Buffalo, New York 14222

C. Northington, Director, Lake Erie Project, U. S. Public Health Service, Cleveland, Ohio

Loring F. Oeming, Executive Secretary, Water Resources Commission, Lansing, Michigan

Kevin O'Gorman, Cornell U., Hamburg, New York

Col. Loren W. Olmstead, Chief Engineer, Niagara Frontier Port Authority, Buffalo, New York

Dorothy K. O'Neil, Sen. Jacob K. Javits

C. R. Ownbey, Chief, Planning & Reports, GLIRB Project

J. C. Parry, New York City, New York

Mrs. Daniel C. Paul, Publication Director, League of Women Voters, Lewiston, New York

E. G. Paulson, Mgr. Process & Waste Water Engr., Hall Lab. Div., Calgor Corp., Pittsburgh, Pennsylvania 15230

Ted Pieczonka, Jr., STP Operator, Lackawanna, New York

Thaddeus J. Pieczonka, Supt., Sewage Treatment, Lackawanna, New York 14218

Chris Potos, Chief Chemist, Erie County Laboratory, Buffalo 2, New York

Ernest D. Premetz, Deputy Regional Director, U.S. Department of Interior, Bureau of Commercial Fisheries, Ann Arbor, Michigan

Brainard E. Prescott, Senator Earl Brydges, E. Aurora, New York

Robert L. Protzman, Reporter, Erie, Pennsylvania Morning News, Erie, Pennsylvania

Sharon Quackenbush, UPI Reporter, United Press International, Buffalo, New York

S. A. Radi, Plant Engineer, American Standard Corp., Buffalo, New York

Raymond J. Cochran, Executive Director, New York State Conference of Mayors, Albany, New York

Frank J. Reddy, Tonawanda, New York

Peter F. Regan, Vice President for Health Affairs, Buffalo, New York 14209

Roger D. Repp, Public Information Officer, Army Engineers, Buffalo, New York

Allan M. Reppenhagen, Treasurer, Citizens Committee, Silver Creek, New York

Mrs. Margaret Reppenhagen, Chairman, Citizens Committee, Silver Creek, New York

Alfred M. Roberts, Director, Wanakah Water Co., Hamburg, New York

Governor Nelson A. Rockefeller, State of New York, State Capital, Albany, New York

Mr. Ronald Rine, Teacher, West Seneca Central School, Buffalo 24, New York

Mrs. Dorothy H. Rose, State Assemblyman, Angola, New York

Mrs. Melvin Rudov, Water Resources Chairman, Amherst League of Women Voters, Amherst, New York

Joseph W. Ryan, Jr., President of Below Assn., Grandview Bay Comm. Assn., Angola, New York

William K. Sanford, Executive Secretary, Association of Towns of the State of New York, Albany, New York

Robert P. Schermerhorn, Director, Empire State C of C, Buffalo, New York 14222

Edward J. Schleicher, Adm. Asst. to Congressman Vigorito, Erie, Pennsylvania

Joseph T. Schmidle, Director of M.D.T., Buffalo Board of Education, Buffalo, New York

Bernard Schwab, Chief Bacteriologist, Erie County Lab, Buffalo, New York

Francis X. Schwab, Executive Secretary, City Planning Division, City Planning, Buffalo, New York

Eugene F. Seebald, Asst. Commissioner for Env. Health, Niagara Co. Health Department, Lockport, New York

Robert L. Seitz, Agent, Infilco, Inc., Tucson, Arizona

Roger Semerad, Coordinator of Federal Aid, State University College, Buffalo, New York

Dr. Howard Sengbusch, Dean, Arts & Sciences, State University College, Buffalo, New York 14222

Allan M. Shapiro, Chief, Data Processing, LEPO, U.S. P.H.S., Cleveland 30, Ohio

P. N. Shellenberger, Superintendent, General Chemical, Buffalo, New York

William Shepherd, Reg. Fisheries Mgr., N.Y.S. Cons. Dept., Olean, New York

Lewis W. Shafer, Director, Allied Sportsman, Buffalo 26, New York

Mrs. Stanley Siembieda, Chairman, Water Resources Comm., League of Women Voters, Erie Co.

Robert C. Singer, Public Relations Director, Soap and Detergent Assoc., New York, New York

William H. Sipprell, Sr., Secretary, Niagara Frontier Port Authority, Buffalo, New York

F. A. Sluntoyser, Erie County, Pennsylvania

John M. A. Sorrentino, Buffalo, New York 14205

Mrs. Ellis R. Spaulding, Clarence League of Women Voters, Williamsville, New York

C. C. Spencer, Buffalo, New York

Stanley P. Spisiak, Chairman, Water Resources Comm., N.Y.S. Conservation Council, Buffalo 6, New York

W. E. Stahlka, Hydraulic Engineer, N.M. Power Corp., Buffalo 3, New York

Michael J. Stankewich, Director, Env. Health, Erie Co. Health Dept., Buffalo, New York

William Steinfeldt, Rochester, New York

John V. Stampien, CFM, AID, USW, Buffalo 15, New York

Earl B. Strowger, Kenmore, New York 14217

Peter M. Sturtevant, Jr., Account Executive, Darcy Associates, Buffalo, New York

Bernard D. Suitor, President, Niagara Front Chptr - Izaak Walton League, Kenmore, New York

M. C. Sumpter, Buffalo, New York

Clark C. Suor, General Manager, Buffalo Sewer Authority, Buffalo, New York

Clarence M. Tarzwell, Chief of Aquatic Biology, U.S. Public Health Service, Kingston, Rhode Island

William J. Tatu, Superintendent, Buffalo Waste Oil Service, No. Tuna, New York

W. H. Taylor, Buffalo, New York

Robert W. Teater, Assistant Director, Ohio Department of Natural Resources, Columbus, Ohio

Mrs. Dorothy Teryl, Buffalo 21, New York

J. E. Tisdel, President, Stimm Associates, Buffalo, New York 14203

Mrs. William Tourot, C.F.M., Buffalo, New York

William C. Treon, Metro Government Report, The Plain Dealer - Cleveland, Cleveland, Ohio

F. E. Tucker, National Steel, Weirton, West Virginia

John S. Tygert, Sanitary Engineer, N.Y.S. Dept. of Health, Buffalo, New York

Dunton F. Tynan, Assistant Solicitor General, N.Y.S. Attorney General, Albany, New York

Edward C. Ulrich, Buffalo, New York

Dr. John Urban, Professor of Science, State University College, Buffalo, New York 14222

Dr. John Urban, Professor of Biology, State University College, Buffalo, New York 14222

Mrs. Lawrence Vagnozzi, Operation Petticoat Progress, Niagara Falls, New York

George G. Valgora, Director, Izaak Walton League, Hamburg, New York

Mr. & Mrs. Paul R. Van Dooser, Buffalo, New York

Harry L. Vanderworp, Technical Director, Peerless Cement Co., Detroit 26, Michigan

A. J. Von Frank, Allied Chemical Corp., Philadelphia 37, Pennsylvania

Phyllis M. Wagner, Conservation Forum, Buffalo, New York

Edgar W. Wagoner, Ant. Pollution Chairman, Town of Wilson, New York

C. R. Walbridge, Manager, Process Wastes Control, Allied Chemical Corp., Morristown, New Jersey

Mrs. Kent J. Ward, Amherst, Buffalo, New York

Mrs. A. Edward Warner, Operation Petticoat Progress, Lewiston, New York

Charles R. Waters, Ex - DPWKS Dist. Engr., Buffalo, New York

A. H. Watkins, Executive Director, Lake Erie Watershed Conservation, Cleveland, Ohio 44114

Gertrude G. Webster, Chairman, Water Pollution Comm., Kenmore, New York 14223

F. W. Wessel, Chief, River Basin Office, U.S. Bureau of Mines, Pittsburgh, Pennsylvania

Richard L. Whitford, Assistant to President, State University College, Buffalo, New York 14214

R. A. Wiener, Socony Mobil Oil Co., New York, N.Y. 10017

Dr. Charles L. Wilbar, Jr., Secretary of Health, Pennsylvania, Harrisburg, Pennsylvania

Jerome Wilkenfeld, Associated Industries of New York, Niagara Falls, New York

P. M. Wilkins, Technical Manager, Mobil Oil Company, Trenton, Michigan 48183

Harold G. Wilm, Conservation Commissioner, New York State Water Resources Comm., Albany, New York

Mrs. Howard Wyranch, Operation Petticoat for Progress, Niagara Falls, New York

N. D. Yale, Assistant to Mgr. Production Carbide, Union Carbide Corp., Niagara Falls, New York

Thomas A. Young, Director, Health and Safety, Buffalo 8, New York

Everett F. Zurn, Water Pollution Control Advisory Board, Fairview, Pennsylvania

PROCEEDINGS

OPENING STATEMENT

BY

MR. MURRAY STEIN

CHAIRMAN STEIN: The conference is open.

This conference in the matter of pollution of the interstate and Ohio intrastate waters of Lake Erie and its tributaries, involving the states of Indiana, Michigan, Ohio, Pennsylvania and New York and the U. S. Department of Health, Education, and Welfare, is being held under the provisions of section 8 of the Federal Water Pollution Control Act.

Under the provisions of the Act, the Secretary is authorized to call a conference of this type when requested to do so by the Governor of a State, and when on the basis of reports, surveys or studies, he has reason to believe that pollution of interstate waters subject to abatement under the Federal Act is occurring.

In a letter dated June 11, 1965, to the Honorable Anthony J. Celebrezze, Secretary of the Department of Health, Education, and Welfare, Governor James A. Rhodes of Ohio requested that a conference be called to consider pollution of Lake Erie. Governor Rhodes' letter to Secretary Celebrezze is as follows:

→ [illegible] water quality [illegible]
[illegible] ←

"Dear Secretary Celebrezze:

The recent Governors' Conference on Great Lakes Pollution held at Cleveland, Ohio, at my invitation, provided evidence that there are widespread contributions to the pollution problems of Lake Erie.

It is true that state and local agencies are making definite progress toward pollution abatement in Lake Erie. However, because of the numerous pollution sources, both within and outside the State, and because of the national significance of this fresh water resource, it is apparent that the Federal Government has a responsibility in this matter.

Under these circumstances, it appears that any effective pollution abatement program regarding Lake Erie should involve local, state, Federal and even international cooperation, and such is our desire. I am therefore requesting that you call a Federal Pollution Conference as soon as possible to institute a plan of action to improve Lake Erie water quality.

You may count on the complete cooperation of this Office and our various State agencies in conducting such a conference.

Sincerely,

JAMES A. RHODES, Governor."

In accordance with that request and also on the basis of reports, surveys and studies, a notice of the conference was sent to the official State water pollution control agencies of Indiana, Michigan, Ohio, Pennsylvania and New York.

The purpose of the conference is to bring together the State water pollution control agencies, the representatives of the Department of Health, Education, and Welfare, and other interested parties to review the existing situation, the progress which has been made, to lay a basis for future action by all parties concerned, and to give the States, localities, and industries an opportunity to take any indicated remedial action under State and local law.

This is a conference between the official State water pollution control agencies of those five States, Indiana, Michigan, Ohio, Pennsylvania, and New York and the Federal Government. These agencies are the Indiana Stream Pollution Control Board, the Michigan Water Resources Commission, the Ohio Department of Health, the Pennsylvania Sanitary Water Board, and the New York State Department of Health and for the Federal Government, the Department of Health, Education, and Welfare.

Under the Federal law, we in the Federal Government may only invite other Federal agencies and other Federal representatives, and the States. All industries, municipalities, citizen's groups and citizens in the States wishing to participate in the conference, must be invited by their respective State agency.

I want to make it clear that we are here as long as necessary. We are here to get the full story and hear everybody that the State will invite, but under the Federal law, it should also be made clear that the State governs its own time and governs the participants from that State. Anyone who wants to participate will have to talk to his State agency and have it put him on the program. Our function is to invite the States here, provide the forum, which we have done, and I can assure you that we will be here and listen and take account of, and give due consideration to all relative views expressed at the conference.

The State of Indiana has designated as its conferee for this conference Mr. Blucher Poole. Michigan will be represented by Mr. Loring Oeming. Ohio will be represented by Mr. George Eagle and I have a letter from Dr. Arnold of Ohio, who writes as follows:

"I regret I am unable to continue my participation in the conference of Pollution of Lake Erie and its Tributaries, the second phase of which is to be held this week in Buffalo, New York.

Illness in my family compels me to remain in Columbus.

Sincerely yours,

E. W. Arnold, M.D.

Director of Health, State of Ohio"

To the Ohio conferees I want to say that I hope that the news is good for Dr. Arnold and that he was indeed most helpful as a conferee in Cleveland last week and contributed in large measure to what I consider to be the success of our conference. Pennsylvania will be represented by Charles Wilbar. New York will be represented by Mr. Robert Hennigan. Mr. H. W. Poston of the Department of Health, Education, and Welfare, with headquarters in Chicago, Illinois, has been designated as conferee for the Federal Government. My name is Murray Stein. I am from Washington, D. C., headquarters of the Department of Health, Education, and Welfare and am the representative of the Secretary of the Department.

The Federal Water Pollution Control Act declares that the States have primary rights and responsibilities for taking action to abate and control pollution. It has long been our policy to recognize this traditional role of the States. However, the Secretary of Health, Education, and Welfare also is charged by law with specific responsibilities in the field of water pollution control, in connection with pollution of navigable and interstate waters which endangers the health or welfare of any persons. The Act provides that pollution of such waters, whether the matter causing or contributing to such pollution is discharged directly into such waters, or reaches such waters after discharge into a tributary of such waters which endangers the health or welfare of a person in a

State other than that in which the discharge originates is subject to abatement. The Act also states that the Secretary shall call a conference at the request of the Governor of any State if it involves pollution of intrastate or navigable waters which is endangering the health or welfare of persons.

We have had two previous conferences dealing with the Great Lakes - one at the lower end of Lake Michigan between Indiana and Illinois where I think the conference came to a very successful conclusion and we have developed an action program which, I believe, and most others believe that if put into effect, and I'm pretty sure it will be put into effect because it's in the process of being put into effect now, will save Lake Michigan and the pure, clean water quality of Lake Michigan for further uses - almost all uses.

On December 6, 1961, Governor Swainson, then Governor of Michigan, asked for a conference on the Detroit River. We have concluded that conference with recommendations in the State of Michigan at the present time, under the direction of Mr. Oeming, who is to my left and who is carrying forth these recommendations and I think Michigan is well on its way to putting in an action program for the control of pollution in the Detroit River.

Mr. Oeming last week at Cleveland gave us the encouraging news that Michigan, in embarking on this program, was about six months ahead of the schedule that we had adopted at the conference, which is good news indeed, considering the schedule for this first phase involved a year, and Mr. Oeming expects to complete that job within six months. So, I think we're well on our way.

Just last week we had a conference in Cleveland.

The conferees came up with recommendations and conclusions. I think several things should be said about these recommendations and conclusions.

One, while we dealt with the problems of Lake Erie as a whole, the emphasis at the Cleveland conference was on detailed presentations by the three western States - Michigan, Indiana and Ohio - not New York and Pennsylvania which a few of us believe will be handled more fully here.

Also, in the Executive Session deliberations, we had representatives of Ohio, Michigan, Indiana and the Federal Government that came up with these. These were neither participated in, developed, nor endorsed necessarily but they may be later, by the representatives of New York and Pennsylvania.

Now, the recommendations that we came up with in Cleveland last week were as follows:

1. The waters of Lake Erie within the United States are interstate waters within the meaning of Section 8 of the Federal Water Pollution Control Act. The waters of Lake Erie and its tributaries within the United States are navigable waters within the meaning of Section 8 of the Federal Water Pollution Control Act.

2. Lake Erie and its tributaries are polluted. The main body of the Lake has deteriorated in quality at a rate many times greater than its normal aging processes, due to the inputs of wastes resulting from the activities of man.

3. Identified pollutants contributing to damages to water uses in Lake Erie are sewage and industrial wastes, oils, silts, sediment, floating solids and nutrients (phosphates and nitrates). Enrichment of Lake Erie, caused by man-made contributions of nutrient materials, is proceeding at an alarming rate. Pollution in Lake Erie and its tributaries causes significant damage to recreation, commercial fishing, sport fishing, navigation, water supply and esthetic values.

4. Eutrophication or over-fertilization of Lake Erie and the Maumee River is of major concern. (This is in Indiana and Ohio). Problems are occurring along the lake shoreline and at some water intakes from algal growths stimulated by nutrients. Algal growths can be controlled, and eutrophication of Lake Erie can be retarded and perhaps even reversed by reducing one or more nutrients below the level required for extensive growth.

5. Many sources of waste discharge in the area still have inadequate waste treatment facilities. The delays in controlling the pollution problem in the area covered by the Cleveland Session of the conference are caused by the lack of such adequate facilities and the complex municipal, industrial and biological nature of the problem.

6. Interstate pollution of Lake Erie exists. Discharges into Lake Erie and its tributaries from various sources are endangering the health or welfare of persons in States

other than those in which such discharges originate and in a large measure, this pollution is caused by nutrients which over-fertilize the Lake. This pollution is subject to abatement under the Federal Water Pollution Control Act.

7. Pollution of navigable waters subject to abatement under the Federal Water Pollution Control Act is occurring in the Ohio waters of Lake Erie and its tributaries. The discharges causing and contributing to the pollution come from various municipal and industrial sources, from garbage, debris and land runoff.

8. Pollution of the Ohio waters of Lake Erie and its tributaries within the State of Ohio endangers health and welfare.

9. Municipal wastes are to be given secondary treatment, or treatment of such nature as to effectuate the maximum reduction of BOD (which is biochemical oxygen demand) and phosphates, as well as other deleterious substances.

10. Secondary treatment plants be so designed and operated as to maximize the removal of phosphates.

11. Disinfection of municipal waste effluents be practiced in a manner that will maintain coliform densities not to exceed 5,000 organisms per 100 ml at public water supply intakes and not to exceed 1,000 organisms per 100 ml where and when the receiving waters in proximity to the discharge point are used for recreational purposes involving bodily contact.

12. All new sewerage facilities are to be designed

to prevent the necessity of bypassing untreated waters.

13. Combined storm and sanitary sewers are to be prohibited in all newly-developed urban areas, and eliminated in existing areas wherever feasible. Existing combined sewer systems are to be patrolled and flow-regulating structures adjusted to convey the maximum practicable amount of combined flows to and through treatment plants.

14. Programs are to be developed to prevent accidental spills of waste materials to Lake Erie and its tributaries. In-plant surveys with the purpose of preventing accidents are recommended.

15. Unusual increases in waste output and accidental spills are to be reported immediately to the appropriate State agency.

16. Disposal of garbage, trash and other deleterious refuse in Lake Erie or its tributaries is to be prohibited and existing dumps along river banks and shores of the Lake are to be removed.

17. Industrial plants are to improve practices for the segregation and treatment of waste to the effect the maximum reductions of the following:

Acids and alkalies; oils and tarry substances; phenolic compounds and organic chemicals that contribute to taste and odor problems; ammonia and other nitrogenous compounds; phosphorous compounds; suspended material; toxic and highly-colored wastes; oxygen-demanding substances; excessive heat; foam-producing discharges; other wastes which detract from recreational uses, esthetic enjoyment, or other beneficial uses of the waters.

18. The Michigan Water Resources Commission, the Indiana Stream Pollution Control Board, and the Ohio Water Pollution Control Board are to undertake action to insure that industrial plants discharging wastes into waters of Lake Erie and its tributaries within their respective jurisdictions institute programs of sampling their effluents to provide necessary information about waste outputs. Such sampling shall be conducted at such locations and with such frequency as to yield statistically reliable values of all waste outputs and to show their variations. Analyses to be so reported are to include where applicable: pH, oil, tarry residues, phenolics, ammonia, total nitrogen, cyanide, toxic materials, total biochemical oxygen demand, and all other substances listed in the preceding paragraphs.

19. Waste results are to be reported in terms of both concentrations and load rates. Such information will be maintained in open files by the State agencies for all those having a legitimate interest in the information.

20. The U.S. Department of Health, Education, and Welfare is to establish water pollution surveillance stations at appropriate locations on Lake Erie. Surveillance of the tributaries will be the primary responsibility of the States.

The Department of Health, Education, and Welfare will assist the States at such times as requested.

21. Within six months after the issuance of this Summary, the State water pollution control agencies concerned are to present a schedule of remedial action to the conferees for their consideration and evaluation.

22. The Federal conferee recommends the following for the consideration of the State agencies:

a. Recommended municipal treatment: Completion of plans and specifications, August 1966; completion of financing, February 1967; construction started August 1967; construction completed January 1, 1969; chlorination of effluents May 15, 1966; provision of stand-by and emergency equipment to prevent interruptions of operation in municipal treatment plants, August 1966; patrolling of combined sewer systems, immediately.

b. Discontinuance of garbage and trash dumping into waters, immediately.

c. Industrial waste treatment facilities to be completed and in operation by January 1, 1969.

23. Federal installations: Waste treatment facilities are to be completed and in operation by August 1966.

24. Representatives of the U.S. Army Corps of Engineers are to meet with the Conferees, develop and put into action a program for disposal of dredged material into Lake Erie and its tributaries which will satisfactorily protect water quality. Such a program is to be developed within six months

after the issuance of this Summary and effectuated as soon as possible thereafter.

25. The conference may be reconvened on the call of the Chairman.

26. These conclusions will be re-evaluated after the material at the Buffalo Session of the Conference is presented.

Now, this is what was determined at Cleveland and should be kept in mind by all those participating in this conference.

Now a brief word about the procedure. We will call upon participants to make statements. We suggest, for the most part, that they identify themselves for the record.

At the conclusion of that the conferees may make comments or ask questions. There will be no comments or questions from the audience. Hold your comments or questions, or your statement, or get them up to your State or Federal conferees, and, if appropriate, he will ask the question for you.

We are making a verbatim transcript of this conference, which will be made available to the State agencies for distribution. It is suggested that if you want a verbatim transcript you get in touch with your State agencies. This should be printed within a couple of months.

With that, we will proceed to call upon, as is our custom, the Congressional and State-elected officials who wish to participate in the conference.

First, I would like to have the honor to call on a distinguished member of the United States Senate, and a distinguished New Yorker and one who has had a tremendous interest in clean water and a clean environment all the time, and has certainly made his influence felt in the Senate since he's been there, Senator Robert Kennedy of New York.

SENATOR KENNEDY: Mr. Stein and members of the panel, I want to first welcome all of you here to Buffalo and to say how grateful we are for Secretary Celebrezze's calling this conference--how grateful we are to all of you for the effort that you are making in this field.

I might say that I'm sure everybody in this room and people all over the State watched the conference which was held in Cleveland with great care and with great interest. We hope that out of that conference and out of the conference that will be held here, we can develop a program for Lake Erie and this part of the State of New York as well as the other states involved, which will go a long way toward dealing with the problem of pollution. It affects all of our lives and will continue to affect us. I think the best opportunity for taking a step which will be meaningful and which will be effective is this conference and the recommendations and suggestions that you make after this conference is finished.

I was delighted to hear the Chairman say that you would be willing to listen to any of those who have information and knowledge about this problem and that you'd be willing to continue the conference to hear them. Of course, they have to be invited through the States, but I understand there are a number of people who have requested to appear before this committee and you were told by the State that you were rushed and you are unable to hear them. I understood the Chairman to say that you would be willing to hear any of those who have information to present at this conference, is that correct?

CHAIRMAN STEIN: That is correct. We will be here as long as there is anyone who is legally invited, and who feels he has anything relative to say.

SENATOR KENNEDY: I know that the people of New York State and the Buffalo Metropolitan Area are very pleased to see this conference convene in Buffalo.

Both Congressman Richard McCarthy and I appreciate the response of Secretary Celebrezze to our request this Spring for a Federal water pollution conference for Lake Erie. In light of the many water pollution hearings that the United States Public Health Service has been called upon to hold this year, I think we are fortunate to have Chairman Stein and his associates hold this hearing here.

I know that everyone in this room is aware of the urgency of this problem. The continuing contamination of Lake Erie is evident to anyone who is familiar with water pollution problems.

I am not sure, however, that the more than 1,000,000 citizens living in the Buffalo area and along the shores of Lake Erie in New York State are fully aware of the need for this conference.

Lake Erie is in danger of becoming polluted to the point where cities can no longer draw drinking water from this tremendous reservoir, where commerce on its shores is endangered and where the growth of algae and other aquatic plants threatens those who wish to enjoy the Lake for boating, swimming or just the magnificent scenery.

The Public Health Service has said in its report dated July 1965:

> Lake Erie and its tributaries are polluted. The main body of the Lake had deteriorated in quality at a rate many times greater than its normal aging processes, due to ... pollution resulting from the activities of man.

If this pollution worsens, the 835,000 people in New York State and the almost 2,442,000 people in other states who draw their drinking water directly from Lake Erie will have to turn to other sources for their water supplies. They may be faced with a report on Lake Erie from the New York State Department of Health stating that the Lake is not suitable from a sanitary point of view as a permanent source of public water and should only be used as a source of water during grave water shortages.

If this sounds unlikely, I might point out that the New York State Department of Health issued a report of this nature for the Hudson River in 1950. As a result, the citizens of New York City who use about a billion and a quarter gallons of water every day do not draw any water from the 20 billion gallons of fresh water that the Hudson pours into the Atlantic Ocean every day.

The industries in the five states that currently use 4.7 billion gallons of Lake Erie's water daily will be forced to look elsewhere for water. If Lake Erie becomes clogged with algae and the pollution level rises, New York State industry, using 1.6 billion gallons a day for power generation and 350 million gallons a day for cooling or other processes, would be severely crippled. The costs of removing pollution after the fact are much higher than those of preventing a source of water from becoming polluted in the first place.

The New York State Legislature has passed during this last session a program which can make some difference, particularly in relation to municipal sewage. Under this program New York State will provide one third of the funds required by municipalities to construct sewage treatment plants. The Federal Government is being asked to provide the next third, and local communities will be required to contribute the remaining 40%.

The voters of New York State have been asked to approve the first part of this program in a referendum that will be on the ballot this November. I hope the voters will approve the proposed bond issue.

In legislation shortly to be enacted in Congress, the Federal part of this program is being completed. Project size limitations that have hindered use of Federal funds for construction of municipal sewage plants are being increased to assist communities in meeting the sewage treatment plant needs. In addition to the increases in project size limitations, $50 million is being added to the funds already authorized, and there are no project size restrictions on this sum.

Thus as a result of the efforts of Congressman McCarthy, in particular, and many others, a total of $150 million in Federal funds is expected to be available this year. New York State will be able to qualify for a major share of these sums.

There are, however, other immediate local, state and Federal steps that can and must be taken now if we are to have any success in combatting water pollution over the long run.

We need more political innovation at the state and local levels, particularly in relation to industrial pollution. Of course, no town or state government likes to tell an industry that it must eliminate pollution. The economics of plant investment often lead a firm to reply that it will relocate its plant in another state if local pollution controls are enforced. Because there are major differences in state regulations and enforcement of pollution laws, industry can play one municipality or state off against another.

One of the barriers to effective local and state enforcement is the fact that communities using water from rivers and lakes crossing state boundaries are currently faced with different pollution standards on each side of a state line. One city cannot reasonably be asked to treat its waste if the next does not. If New York and Pennsylvania, or Massachusetts and Rhode Island, or any two or more states are to effectively reduce pollution, common pollution standards and enforcement for the communities sharing a waterway must be established on both sides of their common borders.

Control of pollution in Lake Erie is a good example of this problem. Michigan, Indiana, Ohio, Pennsylvania and New York as well as Canada are each individually responsible for the control of pollution flowing into Lake Erie. It has been shown clearly that pollution from each of the states affects the quality of the water used by the other states and by Canada as well. Yet there is no common standard of pollution control between the states and Canada. Communities and industry along the Lake are being asked to take steps to clean up pollution, with no assurance that other locations will be required to do the same thing. Unless common standards are applied, it is difficult to require action from communities and industry.

Yet New York, Massachusetts, Vermont, Maine and many other states opposed the establishment of Federal interstate water quality standards recommended in the water pollution legislation brought before Congress in this session.

The water quality standards passed by the Senate this year but rejected by the House should be adopted by Congress.

I have urged the House conferees to join the Senate in adopting these interstate water quality standards. They are a critical underpinning for state and local anti-pollution efforts.

We must go beyond the establishment of standards however, that apply only to interstate waters, and establish and enforce quality standards for all waterways.

I do not believe that continued Federal aid to fight the contamination of water will be available until the states are willing to enforce pollution regulations. There would be no sense in spending large amounts of money to remove municipal pollution in one area only to have a river or stream polluted by the neighboring community, industry or state.

There are a number of ways in which better pollution control can be exercised.

In Germany and England, for example, which are countries that have already faced the water shortage that we are now experiencing, each source of pollution is licensed by the appropriate river or water basin commission so that there is full knowledge of the pollution that is going into the waterway. And certain kinds of pollution are completely prohibited.

We could well do the same here in the United States. At least it deserves a major study. We might, for instance, have a Federally established licensing or permit system, with enforcement generally to be accomplished by states and municipalities. The control agency could be given a right of entry and inspection for all licensed sources of pollution. Such a system of licensing would ensure that competing firms with pollution problems would all be treated alike.

Another source of control might be a user fee applied to each source of pollution on the basis of cost to the government of removing the pollutants that are discharged. Since collective treatment of waste is less costly, this user fee might cost the polluter less than installing his own purification unit would cost.

I also believe that Federal economic assistance to industry in meeting new pollution standards can be provided through rapid Federal tax write-offs of the cost of acquiring and installing adequate pollution control equipment. Assistance of this type could be useful if coupled with a broad attack on water pollution.

Turning specifically to the current conference:

In the first session of the Water Pollution Conference for Lake Erie held in Cleveland, a number of recommendations were discussed by the conferees and, in most cases, agreed to by the conferees from Michigan, Indiana, and Ohio. We do not know whether New York State or Pennsylvania agreed to those recommendations. I hope that with the appearance of Governor Rockefeller today, we will learn that New York will adhere to the recommendations of the conferees, and that they will follow this program, which I think has been so ably set up by the conference.

CHAIRMAN STEIN: Senator, I might indicate that all the recommendations and conclusions arrived at in Cleveland were arrived at unanimously. Michigan, Indiana, Ohio and the Federal Government have absolutely no differences. We are all in complete and unanimous agreement.

SENATOR KENNEDY: Did New York take any position during that period of time?

CHAIRMAN STEIN: New York was not present during the deliberations.

SENATOR KENNEDY: Is that the time New York had left - before the final day?

CHAIRMAN STEIN: Yes, Senator.

SENATOR KENNEDY: I think that the potential results of this conference are important enough to the 11.2 million people living on the shores of Lake Erie to warrant the participation of New York State. I hope that New York State will now endorse the recommendations of the conference so that the five states and Canada can move ahead with a program to eliminate pollution in Lake Erie.

Of particular importance are the recommendations that the communities along the Lake provide at least secondary treatment of their municipal wastes. New York State has at least 50,000 people who discharge waste into Lake Erie with absolutely no treatment at all. It has an additional 1,160,779 residents whose sewage receives only primary treatment before being discharged into the Lake.

I have these figures rising out of your conference, which I think are a serious indictment of the State of New York, in connection with the amount of secondary treatment that is provided by other states - pollution treatment provided by other states in contrast to the State of New York.

For instance, in Ohio, we see that sewage from 3,613,850 people receiving secondary treatment and when we go down to New York, we find it's only 285,000. I think that these reports that you have in your record, contained on page 37, 38 and 39 are of great significance.

Only 285,000 residents are serviced by secondary sewage treatment here in New York, a necessity for all municipal waste if we are to prevent the contamination of the Lake.

Of great importance in the Buffalo area is the need for interception and treatment plants to handle the municipal sewage that normally is washed out into the Lake during rainstorms.

Third, and perhaps the most important recommendation from the standpoint of industrial pollution is the recommendation that specific pollution information from industry and municipalities be reported and maintained in open files by the State agencies controlling pollution.

As I understand it, Mr. Chairman, that was agreed to at the conference in Cleveland, was it not?

CHAIRMAN STEIN: Yes, it was agreed to. The problem we have in several of the States, notably Ohio and New York, is that the statutes--the water pollution control statutes--in those states gives some color to the notion that industrial waste information may be withheld from the public, and of course, we cannot ask that any state official not comply fully with the requirements of his state laws.

However, the Ohio statute read that this information could not be divulged without the permission of the industry involved.

At the Cleveland conference industry after industry, including some of the largest such as Sun Oil, Republic Steel, duPont, Jones & Laughlin,came up and they all indicated that their company policy was to make such information available to interested Federal-state agencies and other agencies which might be interested in the problem. We looked on this as a very encouraging sign because previously, while we had almost unanimity among industry wanting to make this information available, there were some difficult spots.

As far as I can see now, there are very few companies which have not publicly announced that this is their policy--that the public has a right to know what the volume or strength of the material that they put into public waters is.

SENATOR KENNEDY: I congratulate them. I saw a report on that in the paper and I also saw some of the pictures outside this conference, so I congratulate the interest by business and by industry in developing and supporting this kind of a program, in the public interest. I think it's not only worthwhile for them, but it's also worthwhile for all of the people who live at this Lake, and who want to enjoy Lake Erie and need the water from Lake Erie. I think it is going to be absolutely essential. I would hope also as this conference goes along that Governor Rockefeller, when he appears here, will say that either they would develop the same kind of a program here in the State of New York, or ask that this law be repealed. I am sure that the Legislature would be willing to follow his direction on it, if he asks that this law be repealed. That is the great problem here in this State of New York. Then we can move on and publish that kind of information, which I think is in the interest of all of the people of the State of New York. It is certainly in the interest of those who want to deal with the pollution problem.

In a major step taken in Cleveland, referring to your statement, a number of industry representatives agreed to make this information available. State representatives from Indiana, Michigan and Ohio also agreed to the recommendation that this information be collected and made available in open files. As I say, I hope that the State of New York, through Governor Rockefeller, will announce that that will be done here in the State. And if he feels that the law, which I am going to make reference to in a moment--is an impediment, that he will ask for repeal of that law.

I would think that industry and government in New York State would want to fully endorse this principle.

At the present time, referring to the Code that you mentioned, a section of New York State penal code passed last year is used to prevent the State government from releasing specific information to either the public or Federal agencies. I find it incredible that the basic pollution information telling us about the nature of our industrial pollution is not available to either the Federal Government or to the public.

The United States Public Health Service spent over $1,000,000 in making a detailed study of pollution in the Detroit River waters of Lake Erie because the specific information on pollution was not available. I would hope that a similar study would not be required for the Buffalo-Niagara area. Yet if the basic pollution information is not made available, I would urge that a study of this type be conducted.

Four, the Federal conferee in Cleveland also recommended a schedule for the elimination of pollution. State representatives should either endorse this schedule or set a date at which a more acceptable schedule can be agreed to.

Five - Dredging. I also urge the State conferees to agree to the recommendation that the Corps of Engineers work out a plan by which material dredged from Lake Erie and its tributaries, such as the Buffalo River, be disposed of in a manner which will protect the quality of Lake Erie's water.

The control of water pollution is a complex subject of critical importance to New York State and to the rest of the nation. The question is not so much whether we will have water, but what price we pay for water. New York State and the other states on the Great Lakes have been magnificently endowed with clear fresh water. It is up to us to keep from fouling it to the point where it cannot be used without expensive treatment. To do this we must act now.

New York State has been a leader in many areas; in education, in industrial development, and in transportation for example. Yet when foreign visitors ask where they can see effective water pollution control, they are sent to Indiana or Michigan and not to New York State. New York State can be a leader in this critical area. I urge that we take the steps to regain that leadership. (applause)

CHAIRMAN STEIN: Thank you, Senator.

Are there any questions or comments for the Senator, please?

DR. WILBAR: Senator Kennedy is a very distinguished lawyer and was Attorney General of the United States. Is it usual in a court procedure for the judge or jury to make decisions before all of the facts are heard before the court?

CHAIRMAN STEIN: I don't think it is.

DR. WILBAR: Well, I participated in several of these conferences and previously no conclusions have been made at the conference until the conference was over.

There was some implied criticism that Pennsylvania and New York did not concur or take part in the conclusions made in Cleveland. The time for conclusions, I would say, is at the conclusion of the conference, and not in the middle of the conference.

To my knowledge, no other conference held on interstate water pollution has put out conclusions before the conference was completed.

SENATOR KENNEDY: Of course, that's up to the committee itself to make such determination. I would think that the jury has long come in on the question of whether Lake Erie is polluted. I don't think you need another study or another conference to make that decision. I think that the jury has been out and that it came in years ago, and Lake Erie is polluted, and now it's a question of doing something about it.

Let me say this. I think that all of the States and those of us in Congress, and those of us who are Federal officials or State officials or local officials, had the responsibility that perhaps should have been met a long time ago, for dealing with the pollution of Lake Erie.

Now as I understand it, there were certain recommendations that were made and several of the States said that they thought that these recommendations should be put into effect--that they made some sense. I think that it is time to start to develop a program, and again, this is up to your group--it wasn't up to me as I was not in Cleveland--but I think that to say you are going to have a specific and particular program to deal with the problem of pollution of Lake Erie makes a great deal of sense, and I think we should get on with it. (applause)

CHAIRMAN STEIN: Are there any further comments?

SENATOR KENNEDY: May I ask a question? I wrote Governor Rockefeller a while ago, July 15th, and I received a letter back from him dated July 30th, in which he makes a number of points regarding the involvement of the Federal Government in this matter.

One, on the question of how much money is going to be made available at the Federal level. Governor Rockefeller calls for a figure of $250,000,000. As I said, I would hope that $150,000,000 will be made available--$100,000,000 has been allocated now. We are trying to get another $50,000,000. It would appear that this $50,000,000 will be available.

That $50,000,000 that I'm referring to, over and above the $100,000,000, will be free to be used by the Federal agencies and departments in any part of the United States. It is my judgment that if a program is developed here in New York, that a substantial amount of that can be used here in the State of New York.

The billion, six hundred million dollars over a six year period which has been suggested by the legislature and by Governor Rockefeller will have to be passed on by the State and voted on, and of course that can't take place until November, and then each of the communities is going to have to develop their own program. So I would say that I think that the $150 million made available by Congress will be enough at least for the first year, for the operation here in the State of New York. I think that they can work closely together as they develop their programs, but the important thing is to get on with it.

More important criticism however, of the Federal involvement by Governor Rockefeller is contained in the last page of his letter and I ask that this letter and my letter be made part of the record, if that meets with the approval.

CHAIRMAN STEIN: If there is no objection that will be done.

(The letters referred to by Senator Kennedy are as follows:)

* * * * *

"July 15, 1965

Dear Governor Rockefeller:

The people of Western New York have a tremendous stake in the success of the Federal Conference which convenes next month to consider the multiple pollution problems which beset their greatest natural resource -- the waters of Lake Erie.

The Conference, to convene at Cleveland on August 3 and which re-convenes at Buffalo on August 10, was called by the Secretary of Health Education and Welfare under the enforcement authority of the Federal Water Pollution Act.

If that Conference is to be of optimum benefit to the State of New York, the State should give full support to the Conference. We regret that you have not requested that the scope of the Conference include the pollution of the New York waters of Lake Erie which originates within the State of New York.

In a recent statement, Dr. Hollis Ingraham, Commissioner of Health, stated that the lake pollution from which our State is suffering comes 'almost entirely from New York.' Under the law, the Federal enforcement authority can be invoked with respect to intrastate pollution only on the request of the Governor of the State. Thus, New York will not receive full benefit from this Conference unless you decide to request Federal enforcement.

Governor Rhodes of Ohio did make this request for Federal assistance and as a result there will be available to Ohio, legal, technical and financial resources which will not be available to New York.

It is our belief that a state does not relinquish its rights and responsibilities through the use of the Federal enforcement machinery. The enormity of the task demands the employment, on the basis of full cooperation, of the resources of government at all levels. We share Lake Erie with three other states and Canada.

Because of the complexities involved in demonstrating that pollution originating in one State has in fact crossed a State line and is endangering the health or welfare of persons in another State, we regret that an intrastate action involving New York has not been taken in connection with the Lake Erie water pollution control conference.

The Conference gives great promise of success. The groundwork for the Buffalo session is now being laid. Therefore, even if you will not request Federal enforcement, we urge you to exert the powers of your office to encourage officials of the State of New York to put forth maximum effort to make the Conference on August 10 an effective instrument for restoring Lake Erie's waters.

Specifically, we urge the State Department of Health to invite to the Conference those persons -- representing municipal, industrial, conservationist, civic and other interests -- whose presence and participation can add singificantly to the information of the conferees, can put the problem in focus, and can present constructive ideas for the control of lake pollution.

Further, we urge that the State Department of Health work closely with the Department of Health, Education and Welfare to develop for the Conference the fullest information possible on wastes entering Lake Erie and its tributary streams. The leaders of industry, through an appeal to their civil responsibility, should be urged to cooperate and to make available such data as would be requisite or helpful to an accurate evaluation of the pollution problems of the basin and the extent and prospective cost of the measures necessary to their solution.

We are hopeful that you will act soon to assure the residents of the Niagara Frontier that you are interested in developing the full set of facts on the pollution problem on Lake Erie. We know that with the cooperation of State agencies this Conference can be a resounding success and a boost towards cleanup of our lakes and streams.

Sincerely yours,

Robert F. Kennedy
United States Senator

Richard D. McCarthy
Member of Congress"

"July 30, 1965

Dear Senator Kennedy:

This is in response to your letter of July fifteenth regarding the Federal water pollution control conference on Lake Erie.

As you indicate, the conference is being held on the problem of interstate pollution but on intrastate pollution only as it relates to the state of Ohio. Also, as you indicate, intrastate pollution in New York may only be considered at my request.

As you know, New York State has just completed the following steps to permit a rapid cleanup and purification of the waters of the State:

(1) By the end of this year all of the involved New York waters will have been classified as to their best usage and pollution abatement plans for all surface waters will have been completed.

(2) Unanimous passage by both Houses of the Legislature at my request of the Pure Waters Act. This Act involves the issuance of one billion dollars of State bonds in order to:

(a) Provide money for the State to contribute five hundred million dollars to localities as its thirty percent share of the cost of cleaning up the pollution of our waters, and

(b) Provide monies for the State to advance to the localities five hundred million dollars to cover the Federal government's full thirty percent share of the cost. The State advance of the Federal money is necessary, as I explained at the meeting which I called of our New York State Congressional delegation, because at the present time Federal funds are woefully insufficient to meet the needs.

(3) As you are further aware, I have gone to Washington to appear before both the Blatnik Committee in the House and the Muskie Committee in the Senate to urge them to recommend to the Congress an increase in the annual Federal appropriation for water pollution control from the present one hundred million dollar level to a two hundred and fifty million dollar annual appropriation and to remove the provisions in the present law which discriminate against the urban areas and industrial states.

Under the present law and level of Congressional appropriations, New York State only gets five million dollars a year. This is but a drop in the bucket in the face of the one billion seven hundred million dollar expenditure which we must make to clean up our waters. The Federal thirty percent share of this total program for New York is five hundred million dollars. On the basis of the present Federal five million dollars a year assistance, it would take New York State more than one hundred years to clean up its waters. Of course this would be intolerable and that is why the State is moving ahead on its own.

(4) The State at the last session of the Legislature also at my request, greatly strengthened the enforcement provisions of the law with the result that we are now in a position to take action through the courts requiring community and private owners to stop the pollution of our waters.

As a result of the above, New York State, with voter approval of the Pure Waters Bond Issue this fall, should be able to clean up its waters in the next six years.

In light of the above I can see no useful purpose for requesting a Federal study of New York State's intrastate needs nor of Federal enforcement. The time for study has passed. The time for action is at hand. A Federal study now would simply involve delay, duplication and confusion.

What would be helpful, however, would be if you personally would appear before the Joint Conference Committee of the Senate and the House and urge the Committee to recommend amendments to the present Federal law to eliminate the provisions that discriminate against New York and to increase Federal appropriations from the present level of one hundred million a year, to at least two hundred and fifty million dollars a year, and further, to urge that a provision be written into the law similar to the provision in the Interstate Highway Act permitting the States to advance monies against future Federal appropriations so that all States can get on with the program without future delay.

In summary, the answer to our pollution problem in our State is not more outside studies nor Federal enforcement efforts. The answer is money - money to enable the local communities to do the job of construction of pollution abatement facilities. The Federal government can really help by paying its full thirty percent share of the cost of these local facilities. It can help by ending the discrimination against urban states like New York in its aid formulas.

With regard to the August tenth conference in Buffalo, the New York State Health Department will certainly cooperate in every appropriate way both in presenting information and in inviting a broad representation of views.

Sincerely,

NELSON ROCKEFELLER"

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SENATOR KENNEDY: He talks about whether it is necessary to have a study and have the Federal Government involved and he said:

> "The time for study has passed. The time for action is at hand. A Federal study now would simply involve delay, duplication and confusion."

I would like to refer to this Committee's efforts in this field, and I would like to ask you what you are doing at the present time, and what is coming out of it--arising out of this conference that is going to involve delays, duplication and confusion? Would you make a comment about each one of those--delay first?

CHAIRMAN STEIN: Well, I don't think there is any delay. As a matter of fact, perhaps, that's what Dr. Wilbar was referring to.

I think at Cleveland an action program was developed; many things were to take place immediately. As far as I can see, the pollution program was arranged so industrial and municipal pollution could be cleaned up in an operation by January 1, 1969, which seems to me a reasonably rapid rate. Pollution from Federal installations would be cleaned up by August 1966. I don't know that there is any delay contemplated.

As a matter of fact, I think the complaints come from the notion that when the Federal enforcement activity gets rolling, there is a noticeable lack of delay.

I should like to point out to the Senator, too, that we attempt to operate the conferences in the same manner that I think is roughly analogous to a Senate Hearing--that is, we give someone an opportunity to appear. When they don't appear, or if they're not there, we just, as you said many times in your little talk today, have to get on with it.

The pollution problem is so great that it just can't wait, because if we do have to wait, a State representative, merely by absenting himself from a conference, could exercise his veto power over pollution clean-ups at the Federal level. I don't think that is what the Congress anticipated as we interpret and administer the law. If we're mistaken in that, of course, I think the Congress should so indicate. I think that this question has come up before, and we had the unqualified endorsement of both sides of the Congress on that kind of interpretation.

Also, we have had many, many conferences where we have had one, two, three and four sessions and at the conclusion of every one of these sessions, we always come up with conclusions and recommendations.

Again, I don't think this is a novel operation. I should point out that the conclusions and recommendations are subject to your evaluation here, and, in large measure, deal with the three Western States. The names Pennsylvania and New York were not mentioned.

But to answer your question, rather than delay, I think we've got this program off to a tremendous start on the western end of the Nation, and we're moving as rapidly as prudent engineering, construction and evaluation can permit.

SENATOR KENNEDY: Let me ask you specifically if the Federal-State program agreed to by the other states - if that went into effect - if it were agreed to by Governor Rockefeller here in the State of New York, could that go into operation immediately?

CHAIRMAN STEIN: Absolutely.

SENATOR KENNEDY: Would there be any delay at all?

CHAIRMAN STEIN: As a matter of fact, I think that other than a delay, I think that this would be a tremendous speed-up.

MR. OEMING: I think, Senator Kennedy, that there is one aspect of this that should be recognized, and that is that many of these recommendations are still subject, even with the best efforts that the State or the Federal Government can make, are still subject to determination by the courts, should there be issues raised by the voters that they wish to have their day in court.

So, when we're talking about delays, I think we should recognize that enforcement procedures do involve delays and should some of these recommendations--there are interesting possibilities, I think, in some cases.

SENATOR KENNEDY: I suppose that would be true if the State or the local community put in these kinds of steps themselves. They could also have court cases to delay that. In any case, any kind of pollution enforcement that you put into effect is subject to that.

CHAIRMAN STEIN: Yes.

SENATOR KENNEDY: But what I'm talking about is the Federal Government's role in it, other than the fact that it might be taken to court and tested. Actually, if the Federal Government's putting its program into effect, could it go into effect immediately? What you have suggested or recommended is not really a further study, but rather an action program, as I understand it.

CHAIRMAN STEIN: Exactly, and I should point out that what Mr. Oeming says is entirely correct, of course. We have had enforcement cases against over a thousand cities and a thousand industries by now--over two thousand in all. We have only gone to court once, with one city, so I don't look for these spectres of delays, Mr. Oeming, and I'm sure in your Michigan program you, yourself, indicated that you are beating our program that we set in Detroit, by six months.

SENATOR KENNEDY: I agree.

CHAIRMAN STEIN: While we're on Michigan, Mr. Oeming pointed out another fact that I wonder if I could just at this time refer to. While we spent the $1,000,000 in the detailed study of pollution in the Detroit River, it was not because Detroit, Michigan, did not make the information available to us. Michigan always had a policy of open files, and making complete industrial information available to us. The difficulty in the Detroit River was, despite having this information, the situation there was so complex that we needed some more specific information and had to do this.

I think the main crux of your statement is entirely correct--that if we did not get similar information in the Buffalo-Niagara area, that you would urge a study of this type be conducted.

So, I would say, if we didn't get that information for which we asked, as far as I can see it now, we would have no alternative but to go ahead with that--as our statutory obligation, to get that information. I don't see how we could do otherwise.

SENATOR KENNEDY: Should there be any duplication and confusion if this Federal program is put into effect?

CHAIRMAN STEIN: No, sir. As a matter of fact, as it worked out, we have several states here we've worked with through the years. We have so much pollution control business to do throughout the country, we are not interested in duplicating or confusing any issue. If the State can get on with it, we are most happy to withdraw and go somewhere else. The one thing we ought to do is to disengage as rapidly as possible where a case is on the line.

SENATOR KENNEDY: Let me just ask you--there has been a major effort here in the State of New York to classify streams and lakes and rivers, has there not?

CHAIRMAN STEIN: Yes, there has.

SENATOR KENNEDY: As far as classification to the degree of pollution?

CHAIRMAN STEIN: Yes, sir.

SENATOR KENNEDY: Has there been any steps that have been taken by the State, after they have been classified to deal with the pollution?

CHAIRMAN STEIN: I've been following the New York program for a while, and I think the emphasis for the past 10 or 15 years has been their classification. I think the next step contemplated here is the bond issue. But I think the situation has been different in some of the other states such as Indiana. We have here Ohio possibly and Michigan and Pennsylvania, where they don't emphasize the classification technique but they take industry by industry and city by city, and as they go along, attempt to get them to put in improved methods of treatment.

SENATOR KENNEDY: Going back to the point that, as far as New York is concerned, we had the classification of these streams, and possibly the State has the information as to who is responsible for the pollution. I hope and expect that they have it.

That information has not been made public. And, under the law that was passed last year, evidently, it cannot be made public. But as far as dealing with the problem of pollution and ridding the streams or the lakes or the rivers of pollution--that program, up until the bond issue, has not been put into effect in the State of New York as of now.

CHAIRMAN STEIN: I went up the Buffalo River yesterday, and you did, too, and I think that River speaks for itself. Another case is Raritan Bay and the rivers there. I think the facts there speak for themselves, too. I don't think you need scientific studies to really indicate that those rivers are polluted.

SENATOR KENNEDY: We are suggesting here that what the conference is all about is the fact that this information possibly is available. Now we have to deal with the information. Now we have to deal with the particular rivers, the particular lakes, the particular streams that are polluted, and put a program into effect.

What I gather from the conference in Cleveland is that it was supported by the local officials; it was supported by the State officials and it was supported by industry in that kind of a program. I think that's absolutely necessary and essential here in the State of New York. I don't think it's possible just to continue as we have in the past, and so, once again, I congratulate and I thank the conference. I think it is well worthwhile.

CHAIRMAN STEIN: There is one more point in your statement that I'd like to call attention to, because this came up at Cleveland several times. You point out that if pollution worsens, people in New York State and in other states who draw their drinking water from Lake Erie, will have to turn to other sources for their water supply. That's on page 2 where you said that.

Sir, as far as we are concerned in the Federal Government, the Great Lakes, and Lake Erie among them, are our most precious resources of fresh water. As far as we know, they are the greatest single source of fresh water, certainly essential source which we use mostly for large users--the greatest single source of fresh water in the hemisphere, and possibly in the world. If that deteriorates, we will find that in this area, around here, the life of the people will change. If a source of that size goes, it is not very easily replaced, and the people need it for life itself.

Secondly, water probably is one of the most important products used by industry--fresh water that is. Again in the Great Lakes, and in Lake Erie in particular, we--once we have a dying lake, we very well may have a problem of reversing the trend. The miracle of America has been that the Great Lakes have remained fresh so long and have not deteriorated the way other lakes have.

This is not, I should point out, like cleaning up the

Hudson River or Raritan Bay. Because if that's done, we can expect that something like some dredging operations in a year or two will restore it, and we would have that river or that estuary, or that bay, back to reasonable shape within several years if we keep the pollution out.

The question here is, if the pollution rises and the Great Lakes go down as a fresh water source, whether we will be able to maintain the economy of this area and thus maintain the position of the United States as a world power. This is, at least from our point of view, and that of the people working on water resources, one of the most vital issues that we have in the field today. I don't think there can be any question but that a top priority task in the Federal Government is to preserve the fresh water quality of the Great Lakes.

SENATOR KENNEDY: I agree with that. As I understand from your report, there is no question that Lake Erie is a dying lake at the present time.

CHAIRMAN STEIN: According to the report, that's right.

SENATOR KENNEDY: And also from reading your report, there is no question that New York State is contributing to causing the death of Lake Erie.

CHAIRMAN STEIN: That is according to the report, yes sir.

SENATOR KENNEDY: So I think it's about time we met our responsibilities, and ended it.

Mr. Chairman, could I ask that my whole statement be part of the record?

CHAIRMAN STEIN: Yes. Without objection that would be accepted. Do we have copies of your letter, Senator? Some of the conferees would like to see those before I put them in the record.

SENATOR KENNEDY: Well, I have the one from Governor Rockefeller to me.

CHAIRMAN STEIN: I think, at your convenience, if we could have those?

SENATOR KENNEDY: I will, and I'll provide them for the record. I only have this one, and if this can be returned-- it is the original.

CHAIRMAN STEIN: Yes, it can. Thank you very much, sir.

SENATOR KENNEDY: Thank you very much. (applause)

CHAIRMAN STEIN: I have a statement that I'd like to read in the record now, from the other New York Senator, the Senior Senator from New York, Senator Jacob K. Javits. His statement is: (he sent a telegram up to the same effect)

"Because the Senate Labor and Public Welfare Committee has scheduled action this morning on the Bill repealing 14B, I very much regret that I will be unable to attend the Federal Water Pollution Conference in Buffalo. Representatives from my Buffalo Office are in attendance, and will keep me informed of all developments."

We have met the representatives of the Buffalo Office, and they've been very attentive and very helpful.

"It is important to-day to emphasize that Government Officials on the local, State and Federal level are united in an all-out effort to combat pollution in Lake Erie and restore, once again clear, fresh water for the use of the people.

"This is a Non-Partisan issue and should so continue.

"New York State will shortly embark on a precedent setting $1.7 Billion - Water Pollution Control Program, designed to deal with the problem within the borders of the State. Years of research and investigation - details of which will be made available to Federal Officials - have enabled the State to formulate this Master Plan, which can be carried out with the financial assistance of the Federal Government.

"But pollution of Interstate Waters such as Lake Erie, cannot be controlled by a single State alone, and I welcome the Forum, the expert advice and some of the money needed to help us to help ourselves.

"Both Houses of Congress have passed legislation greatly increasing Federal participation in the Water Pollution Control Program, and I am hopeful that the recent naming of Conferees on the measure is an indication that final action will be completed soon.

"Many of the amendments which I offered in the Senate were adopted by the House. One amendment increased New York's share of the funds and another amendment made more money available for Urban Centers. I shall do all I can to see that these amendments are preserved in the final version of the Bill.

"In New York, we have the plans, and we will soon have the money to begin Governor Rockefeller's comprehensive program. This Conference will I feel, highlight the problem and mobilize the public support needed to make successful the State's program within our borders and the Federal Plans to combat Pollution on the Interstate Level.

Jacob K. Javits, U.S.S."

At the present time, we would like to call on a Congressman who has been very interested in water pollution control since his coming into Congress, and he was so interested that he requested to get on the House Public Works Committee, which handles our legislation.

Consequently, he becomes, at least to me, one of my bosses, and I have never had a more attentive or delightful boss, or a man who is so interested in preserving the resources of the country, and particularly the resources of his region, and looking out for the welfare of the Niagara Frontier, and Buffalo in particular. Congressman Richard D. McCarthy. (applause)

CONGRESSMAN McCARTHY: Senator Kennedy, Chairman Stein, gentlemen, today can be a turning point for Lake Erie. Right now this body of water has the distinction of being the worst case of pollution ever recorded by the Public Health Service. It has been called a chemical tank and is considered literally to be a dying lake.

Years and years of unconcern were needed to create this situation, and years of effort may be needed to correct it. But we have to start now or beyond any doubt we will be too late.

The citizens of Western New York are tired of helplessly watching the deterioration of the Buffalo area's greatest natural and economic resource. They are indignant about what pollution has done to our Lake. They no longer can enjoy the natural beauty of sparkling clear water. Recreational use of the Lake -- fishing, swimming, boating -- has been severely curtailed. They are sick and tired of seeing the goose that laid the golden egg killed, because Lake Erie created Buffalo, and in a primitive society, we'd worship it as a God of Creativeness.

And because of the accelerated aging process caused by pollution, the problem may soon become one of whether we will have any Lake at all, because this algae just keeps growing like a green thing. A hundred pounds of phosphate create a million pounds of algae, and if we just keep that up we'll have nothing but algae, and nothing but a swamp.

The people of this area have made it perfectly clear that they do not want their public officials to twiddle their thumbs while Lake Erie dies. They want and deserve action.

I am convinced that this action must include Federal involvement--for three reasons:

1) The problem of Lake Erie is interstate - merely looking at the map confirms this - affecting five States, including one not even bordering on the Lake.

2) The need for action is so urgent that firm enforcement powers are required - powers that no one State, or interstate agency could be expected to supply.

3) In the interest of justice and efficiency, as Senator Kennedy pointed out, it is important that the recommendations of this conference be enforced across the board (this is fairer to industry too), without exception and with deliberate speed.

The challenge facing us is too critical to let jurisdictional jealousies interfere. Only Federal-State partnership can possibly cope with the problem. Governors Rhodes and Romney have recognized this fact, but inexplicably Governor Rockefeller has repeatedly refused to request Federal enforcement. Senator Kennedy and I, as he pointed out, formally urged the Governor to make such a request, but he has not.

This should not be a partisan issue, and believe me, it isn't with me. I just want to see the job get done. It is not a matter of States' rights. It is a question of seeking assistance from all quarters in order to return Lake Erie to good health. Governor Rockefeller would not be relinquishing the prerogatives of New York State by combining State and Federal resources in this effort. Rather, he would be serving the best interests of the people of New York State.

Likewise, it is time for municipalities and industries to realize that the public wants an end to pollution. We in Washington know about and are sympathetic to the financial problems involved in the costly process of abating pollution.

There will be more Federal funds for the municipalities. And if the voters of New York State approve, as I sincerely hope they will, there will also be, thanks to the Governor's initiative on this, a State aid to help the hard-pressed towns, villages and cities install the necessary waste-treatment facilities.

As a 13-year veteran of the National Gypsum Company, I am very sympathetic and fully aware of the problems of businessmen. I have introduced legislation to provide fast tax write-offs to industries that install highly expensive pollution abatement equipment. The White House is interested in the Bill and in similar bills. I'm not the only one who introduced a bill like this. Senator Ribicoff did, too, and I'm hopeful that this legislation will be forthcoming.

I want to make it clear that the Federal Government is sincerely trying to do its part. To date, it has expended $800 million, simply for the construction of waste-treatment plants, and as the Senator pointed out, next year we'll raise that by $150 million, of which New York State will receive $9,880,000 and on the 30-30-40 formula, this would generate $33 million worth of waste-treatment construction in one year, or $198 million in six years. We tried to raise that in the House. I got my amendment in adding $50 million, and we tried to make it another $100 million, but we were outvoted by the coalition. I am hopeful that as public pressure on this builds up, that we will be able to increase the Federal participation still more.

New York State, I am sure if the voters approve, will do its share. But the municipalities and industries have to do their part, too. And I'd like to suggest that we all face up to the fact that the people want action from all of us.

There are no mysteries regarding the pollution of Lake Erie. We do not need to conduct extensive research before corrective action can be taken. Far too often the cry for further research, surveys and studies has been simply a technique for procrastination.

Numerous technological advances already have yet to be taken advantage of. For instance, the Rand Development Corporation recently developed a new sewage treatment process that is both more effective and more economical than present methods. It uses coal and produces electric power as a byproduct.

So it is not more studies that we need. Nor is it expressions of good intentions. What we need from this conference is a firm schedule of steps to be taken with specific deadlines and--as Mr. Stein outlined previously have been set up for the other three States--clear identification of responsibilities.

I sincerely hope that the Governor will see fit to make this a joint Federal-State effort, and that local public and industry officials will cooperate in following the recommendations that this conference will make.

Finally, let me stress the importance of Federal enforcement.

Federal procedures will get action faster than State procedures, as the colloquy between Senator Kennedy and Chairman Stein I think elucidated.

The New York State law, the new law alluded to, while it eliminates the old one-year grace period, still enables a municipality or industry to stall for an additional five years--that would take us to 1970--before ceasing its pollution of our waters. All the polluter has to do is to go to court or appeal to the Water Resources Commission for an extension of up to five years.

Experience shows that compliance can be brought about under Federal procedures in as little as two years, as the timetable of Chairman Stein pointed out.

But unless the Governor, like Governor Rhodes, requests Federal action, the war on Lake Erie pollution I'm afraid will be slowed. For then the Public Health Service will have to prove that New York pollution endangers the health and welfare of States to the west. Extensive studies of scientists of the Public Health Service over the past two years have shown that the Lake's currents flow intermittently eastward as well as westward over the Falls. They are reasonably certain that contaminants originating in New York State intermingle with others in the Lake, but to prove this in a quasi-court proceeding would be extremely time-consuming and expensive.

But if New York persists in this, I'm afraid that's what we'll have to do.

That will mean more months of delay which we really can't afford.

I suggest that this time-wasting effort can be avoided, and that all New York State has to do is to request the Federal enforcement procedures.

Thank you, Mr. Chairman. (applause)

CHAIRMAN STEIN: Are there any comments or questions from the conferees?

MR. POSTON: Congressman McCarthy, I notice that on Page 1, you say that only Federal-State partnership can possibly cope with the problem, and I would like to tell you a little bit about our Federal water pollution control program.

We feel that the States have the responsibility for control of pollution, and our Federal program is geared to support and aid the States' program. We have many ways, and I like to think of these as tools for assisting in States' water pollution control activities.

First off, we have technical assistance. With a research facility at Cincinnati, we provide technical assistance to States, municipalities, industries, where they have particular and specific problems that they need assistance in.

We have a grant program, where the Federal Government gives grants to municipalities, and since this program started in 1956, we have been of assistance to the States in helping them get up and solve some of the particularly knotty problems. Where municipalities have been unable to move ahead with construction works, this grant program has been helpful. I particularly think of two municipalities in our region which have been under pressure from the State agencies for a period of up to 20 years. They constructed plants early in the construction grant program.

We have another aspect of our program, which is comprehensive planning and we give assistance and cooperation in long-range plans for control of pollution in particular basins, and this covers across State boundaries so that we will have uniformity and so that nobody can say "I didn't expect this kind of a thing to occur."

And then we have a research program. Congress has authorized and appropriated monies for regional water pollution control laboratories, to do research in problems of a particular area. One of these will be located at Ann Arbor, Michigan, and this laboratory will be expected to study problems in the Lake to assist in this over-all pollution problem.

One other tool that we are using here today is the enforcement aspect and enforcement in general is used for pollution abatement. Pollution from one or a number of States might affect other States than where it originates, and this is a problem that State agencies do not have the power to cope with; when pollution from another State affects them, they have no authority to move in.

I think these are the ways the Federal program is geared to support State activities and local activities, and we sincerely desire, as the Chairman has pointed out, to disengage from individual activities as quickly as possible - as quickly as they are carried on at a local level.

CONGRESSMAN McCARTHY: I think this kind of partnership is certainly what we need. We have to work together in this, and I really hope that the New York State people will see this. It's just pretty clear to me that we can get the job done quicker and more harmoniously with this kind of a partnership arrangement. I hope that's what we'll get.

CHAIRMAN STEIN: Thank you. Are there any further comments or questions of the Congressman? If not, thank you very much.

CONGRESSMAN McCARTHY: Thank you. (applause)

CHAIRMAN STEIN: We have two more Congressional communications which I would like to read. This is a telegram, addressed to me, as Chairman.

"PLEASE KNOW THAT I AND MY CONSTITUENTS IN THE FORTIETH DISTRICT OF NEW YORK ARE VITALLY INTERESTED IN POLLUTION CONTROL AND PURE WATER. I AM CERTAIN THAT AFTER YEARS OF STUDY, RESEARCH, AND FACT-FINDING SESSIONS, THE FEDERAL GOVERNMENT IS ABUNDANTLY AWARE OF THE IMMENSITY OF THE CRITICAL WATER POLLUTION PROBLEMS IN LAKE ERIE. WE HOPE THAT YOUR CONFERENCE IS EMINENTLY SUCCESSFUL IN INSTITUTING POLLUTION CONTROL ENFORCEMENT FOR ALL LAKE ERIE AND ITS TRIBUTARIES."

Evidently there is bi-partisan Congressional unanimity, because this is signed by Henry P. Smith III, Representative, Fortieth District.

I also have a statement by T. J. Dulski of the 41st District, for insertion in the record. It says:

"Mr. Chairman: I regret that it is impossible for me to appear personally at this conference which has been called to discuss further the water pollution in Lake Erie, and I appreciate this opportunity to submit my statement for the record.

"I see no necessity in repeating here what we already know about water pollution in our area. We know the problem exists. Experts have studied it, and they are unanimous in their opinion as to the severity of the problem. They have made their reports and recommendations.

"It seems to me then, that the immediate problem is to implement those recommendations with action. It is the problem of successfully coordinating Federal, State and local agencies so that they will function together and create the machinery needed to clean up these contaminated waters. We know it is not solely the responsibility of the Federal Government. Congress has passed legislation aimed at helping States and municipalities in combatting the problem, but due to lack of enforcement procedures, such regulations as were promulgated were weak and ineffective.

"We are now in the process of enacting a Federal law designed to strengthen these important procedures, and provide increased assistance to local communities. Neither is the pollution problem the sole responsibility of the State or the municipality, but they should not tarry in recognizing the urgency of the situation, and avail themselves of the assistance offered through the Federal Government.

"I urge the Governor of our Great State of New York to take swift action, and join forces with our City of Buffalo and the County of Erie in drafting a plan so that we can embark upon a program to rid Lake Erie and its tributaries of these infested waters. I urge all local officials concerned to give top priority to the solution of the problem. We know the facts. Now, let us move quickly toward the formulation of the program that will halt further pollution immediately, and then proceed on the most practical basis possible, to clean up the polluted areas.

"We have already done far too much talking, and too little acting.

(Signed) Thaddeus J. Dulski,
Representative 41st District of New York"

and dated August 10, 1965.

We have received word that Governor Rockefeller is in the air somewhere above Buffalo. Our present program, of course, is to try to get him on before the luncheon recess. At the present time, I suggest we recess for ten minutes, but please be in first call, because we may want to reconvene rather quickly.

(WHEREUPON A SHORT RECESS WAS TAKEN)

CHAIRMAN STEIN: With the cooperation of our sister Water Resource Agency, I think we are going to be able to handle the rest of the morning rather well, I hope, and take into account the Governor's schedule.

We will call upon the Department of Interior and this will be the Regional Director, or Regional Coordinator, Mark Abelson, and then Mr. Premetz will speak after him. When the Governor comes in--and we expect him at 11:50 now--we will interrupt Mr. Premetz. We will put the Governor on, and Mr. Premetz then will be able to continue later, because he will be available.

We would like to express our thanks to the Department of the Interior. Mr. Abelson, are you ready to make your presentation? As always, we find the Department of the Interior one of the most cooperative sister agencies connected in the field of water pollution control.

Mr. Abelson?

MR. ABELSON: If this sounds a little disjointed, it may be due to the fact that the man just took it to get it duplicated, and I hope he put the pages back in the right order.

Mr. Chairman, Members of the Conference, I am Mark Abelson, Regional Coordinator for the Northeast Region of the Department of the Interior.

The Department of the Interior, which is the principal Federal agency concerned with natural resources has a definite interest in all waters of the country and in the entire pollution problem.

In order to coordinate the efforts of all those concerned with the related water problems, there must be comprehensive planning and activity among all interested. The interest of the Department of the Interior in water can be best expressed by quoting from a recent statement by Secretary Udall before a Congressional committee:

".....the focus of Interior effort is directed to the maintenance of adequate national water supplies and adequate water quality for whatever uses man may wish to make of this valuable resource. The Interior approach emphasizes the coordination and interrelation between uses and the effect of these uses on management and quality of the total water supply system.

"Maintenance of water quality involves not only the quality levels for human consumption, but also quality levels for consumption by other animal and plant life, for development of other natural resources, and for industrial processes. These quality considerations are interrelated. They can be understood and controlled best from the point of view of water as a resource, rather than from the point of view of a particular quality need."

In handling the water problems over a period of years the Department has accumulated a great deal of experience. It has the facilities and the qualified manpower to deal with a wide variety of water problems. The Department has six operating Bureaus and one office in this region, which have an interest in the region's water resources, ranging from purely unbiased fact finders to strong advocates of clean waters. These Bureaus are:

The Bureau of Mines; Geological Survey; the Bureau of Sport Fisheries and Wildlife; National Park Service; Bureau of Commercial Fisheries; Bureau of Outdoor Recreation; and the new Office of Water Resources Research.

Interior Bureaus carry on water quality studies related to the physical, chemical and in some degree, biological adequacy of natural and developed water supplies. These studies and research are chiefly those in which the skills and required knowledge are based on geology, chemistry, hydrology, engineering and other physical science aspects of water management. Interior's water quality research extends to the study of environments adequate for the propagation, production and control of both fish and wildlife resources, and for water based recreation.

In common with many others, Interior has interests and responsibilities in the economic and social aspects of water-quality management. We recognize that such factors as quantitative requirements, competitive uses and marketability of water and associated products must be given consideration in all plans. Interior takes account of the economic impact and other values that protection of water quality will have on the community, the basin, the State and the Nation.

I will now present the responsibilities of the various Bureaus concerned in the matter of pollution of the interstate waters of Lake Erie.

Mr. Chairman, the statements that I have from the Bureau of Commercial Fisheries, the Bureau of Sport Fisheries, the Bureau of Mines, have been presented at Cleveland, and are the exact same statements that I have here.

CHAIRMAN STEIN: Do you want to summarize them, or we can have them in the record or duplicated in the record?

MR. ABELSON: I believe that if they were just duplicated in the record, it would save some time.

CHAIRMAN STEIN: We would be very happy to do that.

MR. ABELSON: Each of these Bureaus emphasize its role in the Lake Erie, and the need for data and clean waters. In addition to this, the Geological Survey at Cleveland presented a statement covering just the western part of the Lake, and I will now present their statement on the eastern part. In addition, I have a statement by the Bureau of Outdoor Recreation, concerning Outdoor Recreation on Lake Erie.

WATER RESOURCES ACTIVITIES IN THE EASTERN PART OF THE LAKE ERIE BASIN

The U. S. Geological Survey is responsible for describing systematically the Nation's water resources and monitoring changes in these resources, to provide a continuing appraisal of their availability and development. The water-resources activities of the Geological Survey include (1) the measurement of streamflows and changes in lake, reservoir and ground-water storage, (2) the mapping of ground-water reservoirs (aquifers) and determination of their yields, (3) analysis of the chemical quality of both surface water and ground water and (4) research into the fundamental laws governing the occurrence and movement of water both on and beneath the Earth's surface.

Approximately 70 percent of the water-resources activities of the Geological Survey are supported jointly and equally by the Federal Government and by State and local agencies. The programs are, therefore, responsive to and reflect both the National and the local needs for water knowledge

The water-resources activities of the Geological Survey in the eastern part of the Lake Erie basin are described below. These studies are supported in New York by the State Water Resources Commission, the State Departments of Health and Public Works and by the Corps of Engineers. In Pennsylvania, they are supported by the Department of Forests and Waters.

One of the most important activities of the Geological Survey consists of the collection of basic hydrologic data. These data and the number of stations at which they are being collected or have been collected during the past year in the Pennsylvania and New York portions of the Lake Erie basin are listed below:

Stream discharge....................	33 stations
Ground-water storage...............	12 wells
Chemical quality of streams........	7 stations
Chemical quality of ground water...	7 wells

Another major activity of the G. S. in the Eastern Lake Erie basin consists of areal studies of the water resources of specific areas. Studies in progress at the present time include the following:

Lake Erie-Niagara area. The Lake Erie-Niagara area consists of the 2,000 square miles centered around Buffalo that extends from Cattaraugus Creek on the south to Tonawanda Creek to the north. This study, which was started in 1962, is being conducted in cooperation with the New York Water Resources

Commission and the Erie-Niagara Regional Planning Board. The objectives of the study are to determine how much water is available in the area, the extent to which the quantity varies with time, and the chemical quality and sediment content of the water. An interim report describing the results of the first year of the study was published in 1964 as Bulletin GW-52 of the New York Water Resources Commission. The final report on the study is now in preparation.

A study of the time of travel of water, and associated analysis of streamflow characteristics, has been made in ten regions of six major streams in the Lake Erie basin. The field work was done in 1964 and 1965 under a cooperative agreement with the New York State Department of Health. A report on this activity is in preparation.

Drainage areas and other selected data on the physical features of all named streams in the Lake Erie basin in New York have been determined. A compilation of drainage areas at selected points is being prepared for the purpose of interagency coordination of data. A separate gazetteer of named streams is also being prepared. This will list data on length, elevation and area, as well as cultural features of location.

Now the Bureau of Outdoor Recreation present the following statement:

The pollution problem of Lake Erie, which primarily affects the littoral zone of the lake, exists at undeveloped as well as developed areas. Its effect is equally serious, whether directly or indirectly related. It creates great difficulty in managing outdoor recreation activities at cities such as Erie, Pennsylvania and Buffalo, New York, but is also present in more remote sections of the Lake.

Frequently at Presque Isle State Park near Erie, Pennsylvania, the closing of one bathing area because of a high bacteria count results in diminished utilization of the other beaches because people assume the entire area is unfit for swimming.

At Lake Erie State Park near Dunkirk, New York, bathing is curtailed at times because of algae "blooms". For lack of suitable residential sewage disposal added nutrients find their way into the Lake and cause abnormal increase in algae.

The pollution problem is not related only to swimming. Boating and water skiing are also affected because of industrial wastes that cause unsightly waters, obnoxious odors, or even chemical or physical effects to boats, seawalls and beaches.

From the aesthetic standpoint, driving for pleasure and sightseeing are adversely affected by the appearance and odor of polluted waters.

As I mentioned at the start, I have statements here which have been given to the secretary, or to the recorder, which are similar to that made at Cleveland. I have experts here from all the fields mentioned, and if there are any questions, I am sure that we can answer them.

CHAIRMAN STEIN: I am sure of that, too. I've been up against your experts before.

Are there any comments or questions from the conferees?

MR. ABELSON: Mr. Chairman, Mr. Premetz will give an additional statement by the Bureau of Commercial Fisheries.

CHAIRMAN STEIN: Thank you very much. Will Mr. Premetz come up?

MR. PREMETZ: Mr. Chairman, Conferees, ladies and gentlemen, I'm doubly pleased to be here today, because of my extreme interest in the problems of Lake Erie and also because I spent most of my life along Lake Erie. I was born in Cleveland, entered grade school there and then moved to Buffalo, New York, entered high school and also the University of Buffalo here, so I've watched this Lake deteriorate over the years. It hits home when you've been that close to it, and we're here to do something about it.

The Bureau of Commercial Fisheries has been actively participating in the Public Health Service's Illinois-Great Lakes River Basin Project, which includes Lake Erie. In fact, our scientists are closely coordinating their research efforts with those of the Public Health Service, to assure that pollution abatement measures reflect full cognizance of fishery problems. The aim is to prevent further deterioration and to the extent possible mitigate the damage that has already been done to fish and aquatic life.

In the early stages of the Public Health Service study some two years ago, the Bureau of Commercial Fisheries was pleased to make available to the Public Health Service, the use of vessels and the technical know-how of its personnel. Many of the Public Health Service scientists concerned with the study were afforded an opportunity to work intimately with and, in some cases, receive guidance from the Bureau's experts, who have had extensive experience with Great Lakes fisheries, and the effects of pollution on fish and aquatic life.

We have been interested in fisheries in the Great Lakes area since about 1871, so our research goes back a long ways. We have been more and more concerned in recent years. In fact, 10, 15 years ago, our scientists warned that we were going to see what we are seeing today. They were labelled "alarmists". It's come to pass, and we're going to have further deterioration and we're going to have a horrible mess in both parts of the Lake, unless we do something about it.

Let's talk about the eastern end of the Lake. Many have said, "Well, the situation isn't as bad in the eastern end of the Lake as it is in the western end". That's true. It isn't. But it will be in 10, 15 years. We already see the signs of the development of a problem in the eastern end of this Lake, similar to what we already are experiencing in the western end. Now is the time to do something about it.

Evidence has been accumulating for some time that pollution may be one of the major factors in limiting the production of fish in not only our fresh waters, but also in our estuaries along our coastline, and even in the open ocean. I just recently picked up an article in one of the newspapers, which reads:

"DDT in Antarctica as Sequel to 'Silent Spring.' Scientists are puzzled by the fact that they are now finding quantities of DDT in seals, penguins and fish in the remote lands, thousands of miles from the nearest pests in gardens."

So how did they get there? We talk about this problem of interstate pollution. Actually, aren't we experiencing worldwide, intercontinental pollution? Actually, don't we consider the Great Lakes as one big river, floating into the ocean? Aren't we dumping all of this sewage into the ocean--where it goes we don't know? It gets into the currents, and it's distributed all along the coastline, not only of this continent, but of other continents. This is a serious problem. Let's not minimize it.

I have heard many, many definitions of pollution. Of course, these definitions depend on the interest of the particular person you are talking to, but almost everyone today--I think today--not a few years ago, but today, will agree that pollution means the addition of something, whether it be trash, chemicals, biological entities, or even heat, which reduces the quality of an environment for specific purposes.

A widely accepted measure of pollution is the suitability of water for a required use. We're concerned about the suitability of water for fish and aquatic life, and so are many, many people along our great Great Lakes shoreline, and in inland areas who enjoy fishing on Lake Erie, and enjoy eating the fish from Lake Erie.

We cannot consider a single set of water quality standards as being applicable for all uses. You have heard about standards, about developing standards. These standards must be flexible. They must take into account all uses, unless we're willing to sacrifice some of these uses.

At this point, I might interject that the steps taken here today, and at previous conferences, are only a first step. We don't have all the answers. We still need extensive research to get the answers. We should not become complacent and decide now, "Well, if we put all these treatment plants in now, our problems are all solved, and we're going to have a nice, clean Lake Erie." We've waved the magic wand. We've found the Fountain of Youth and we're going to rejuvenate Lake Erie. This is not the case. In fact, it is very, very doubtful that we will ever see the good old days of Lake Erie--that we will ever see the species of fish we once enjoyed in Lake Erie, but if we don't do something now, we're not going to be around Lake Erie to enjoy anything.

People have asked me, "When will Lake Erie die?" when we talk about a dying lake. I don't know. No one can answer this question, but it is coming. I will say this. Whether it happens in our lifetime, or in the lifetime of our progeny, the one thing that we must remember is that none of these people will be around to see Lake Erie die, because long before Lake Erie dies, it will cease to function as a useful resource. It will be useless to all of the people that wish to use Lake Erie for all of the various purposes that it is used for.

I notice that the Governor is coming in, so at this stage why don't I stop, and let Governor Rockefeller come up here and make his speech. (applause)

CHAIRMAN STEIN: You know, they say you have for the President a long and a short introduction. You can say either, "The President of the United States" that's the short one, but the long one is "Ladies and gentlemen, the President of the United States." I think with Governor Rockefeller we don't have to do any more. Governor Rockefeller. (applause)

GOVERNOR ROCKEFELLER: Thank you very much. I apologize for being late. Traffic conditions at two airports resulted in the delay.

I'd like to thank you very much, Mr. Chairman and members of the committee, for the privilege of appearing here today. I don't think I have to say to those present in this room that Lake Erie pollution is of vital and continuing concern to New York and we welcome the active interest of the Federal Government in what is in fact a serious international and interstate problem.

Four years ago, in recognition of this problem, I requested Secretary of State Dean Rusk to bring the question of Lake Erie pollution before the Canadian-American International Joint Commission. The Governments of the United States and Canada did so just last year.

As a "downstream" state on Lake Erie, New York's concern extends to the pollution control progress being made not only by our communities but by our "upstream" neighbors as well.

Upon my recommendation and with the unanimous approval of the Legislature, New York has initiated a comprehensive and massive program to end water pollution throughout our State. This billion-dollar State program--the boldest yet launched in this country--may well point the way to decisive progress in other states, if there is full and proper support from the Federal Government. Nothing short of a national attack on the blight of pollution on such a scale is worthy of the problem's real dimensions.

It is for this reason that I went to Washington in February to personally urge President Johnson and, at his suggestion, Secretary Celebrezze of Health, Education, and Welfare and the Department of the Interior to support the goal of ending the pollutions of pure waters to which the President referred in his State of the Union Message earlier this year.

My plea was that the President recommend to the Congress the appropriation of funds on a scale comparable to the magnitude and urgency of the problem we face--and to the scale of the financial effort which I had recommended to the New York State Legislature. In essence the problem facing the Nation is dramatically illustrated by the following figures:

In New York State alone, we must spend $1.7 billion, to end the pollution of our waters. Toward this goal, under existing Federal air programs for pollution control, New York State only receives $5 million a year from the Federal government. Five million toward the needed expenditure of $1.7 billion in New York State is barely a drop in the bucket.

The President was sympathetic but has so far made no recommendations to the Congress for increased appropriations. The Secretary of Health, Education, and Welfare was sympathetic and recommended that I go to the Congress and make my plea directly, which I subsequently did before the Blatnik Committee of the House on February twenty-third and the Muskie Committee of the Senate on May nineteenth. In addition, I called a special meeting of the New York State Congressional Delegation to enlist their support with the Committees and the Congress as a whole. Since then the Legislature in New York State unanimously voted the authorization of a billion dollar bond issue which I had requested for this purpose subject, of course, to the approval of the people in November. But the Congress has not acted and the Senate and the House Committees are still in conference.

However, I am much heartened by the fact that the President of the United States has called a meeting for tomorrow morning at the White House of the Governors and Mayors of New York, New Jersey and Pennsylvania to discuss the water problem. I am hopeful that now in the light of the dire water shortage due to the drought that the President will recommend prompt Congressional action to appropriate sufficient funds for pollution control, and to amend the Federal laws to eliminate the existing discriminatory features against the industrial and urban states.

It is my purpose in joining the conferees here today to discuss the real needs which must be met to help us solve the critical problem of water pollution in Lake Erie--in New York State, and throughout the United States.

There are some facts which must be faced.

The primary fact is the staggering cost of building water pollution control facilities. As I already mentioned, we estimate that it will cost $1.7 billion to build the new treatment plants and intercepting sewers needed by our communities in New York now and through 1970. This estimate is not plucked out of the air. It is based upon our Health Department records as well as a $200,000 State-conducted engineering study, using field survey methods, which evaluated the specific needs for sewage treatment facilities in every community in the State.

The second fact we must face is a corollary of the first. Confronted as we are with such a tremendous backlog of needed facilities, pollution control laws, be they state or Federal, and pollution control conferences, be they state or Federal, cannot be fully effective until we decide to make the massive financial commitment required to eliminate the backlog.

I am convinced that we can end water pollution only by moving on a broad front through a concerted intergovernmental effort to provide the wherewithall for communities to meet their needs and to provide incentives for industry to comply.

These are facts which certainly are not unique to New York. New York's needs are shared with every other urban area throughout the Nation.

I submit that the Federal Government has not faced up to the problem realistically. As I pointed out, its present program of grants-in-aid for the construction of sewage treatment facilities is woefully inadequate to overcome the huge backlog of facilities needs that presently exists. (I say here parenthetically, ladies and gentlemen, that the members of the Committees in the Senate and House and the members of the Departments directly involved in Washington are most sympathetic to this fact, and are deeply dedicated to getting the Federal appropriations levels raised to a point where this problem can be dealt with effectively. I might say also parenthetically, that Under Secretary of the Interior told me that as things now stand at present Federal appropriation levels, we are losing ground in the United States as far as water pollution is concerned, not gaining ground.) The inadequacy of the program in terms of size is compounded by limitations on grants and by a formula for allocating the available funds among the states which discriminate against urban areas where the facilities need is greatest.

I submit that the State of New York is presently undertaking a program which is responsive to the real needs and which will end water pollution in New York State in a period of six years, if the public supports the bond issue this Fall.

We know what our problem is. The classification of all surface waters in this area has been completed and specific abatement plans will be completed by the end of this year.

We have laid the groundwork for decisive action. Through a State Constitutional amendment which I recommended and which the people of the State approved in 1963, local government obligations incurred until 1973 for sewage works are wholly exempted from constitutional debt limits. This was a very important and necessary step. In addition, New York State's Constitution and statutes have been amended to encourage intermunicipal cooperation to meet area-wide service needs in the most efficient and effective manner. As a result of legislation which I recommended, the State now pays 100 percent of the cost of comprehensive sewerage planning studies undertaken by municipalities on an area-wide basis, and $9 million has already been appropriated for these studies.

And now we have initiated truly decisive action--the comprehensive Pure Waters program to end water pollution throughout New York State in six years.

To be more specific in relation to this Pure Water Program, let me give you some of the elements that go to make up the program.

1. Authorization of a $1 billion State bond issue to provide the financial means to communities to overcome the huge backlog of facilities needs by reducing the local share of the cost of such facilities to 40 percent, and frankly the thing that has held us up throughout the State has been this tremendous cost factor. This billion-dollar bond issue authorization, which is the key to the success of the program, was unanimously approved by the New York State Legislature and will appear on our ballot this November for approval of the voters. Through this bond issue, the State will take the leadership in Federal-state-local sharing of the costs of constructing new sewage treatment plants and intercepting sewers. The State will assume 30 percent of the cost to the local community. If necessary, the State will also pay another 30 percent to the local community, 30 percent of the cost of such facilities, representing the proper Federal share. Such pre-financing of the proper Federal share of the cost, without waiting for

Federal action, will enable New York to avoid delay and to eliminate the backlog of needed works as quickly as planning and construction timetables will permit.

I might just add another word there, although the gentlemen at the table, of course, know the details. But to illustrate how the limitations of the Federal law operate under existing law, which ostensibly gives 30 percent of the cost to a local community, no community can, for one plan, get more than $600,000. The last big New York City plant cost $83 million, so that the 30 percent representing $600,000 didn't go very far in paying for their share. In addition, there were other limitations, which resulted in New York City only getting $250,000 for that plant, which cost the City $83 million. This is what we are trying to get around by this program of the State, so that we will put up State money for one-third, we will put up 30 percent and we will pre-finance the Federal 30 percent for the full amount, giving the local community 60.

2. State and local tax incentives to spur construction of new industrial pollution control facilities. A one-year depreciation write-off for industrial treatment facilities under our corporate franchise tax and the provision of real property tax exemption are now the law of the State, unanimously adopted by the Legislature at this last session, upon my recommendation.

I guess I might say there again, parenthetically, that under our State Constitution, the State has no right to assist a private corporation, but we can adjust our tax laws to encourage and to facilitate the private corporations from making these expenditures.

3. State aid to localities for one-third of the cost of operating and maintaining local sewage treatment plants. This aid was authorized upon my recommendation in 1962 but funds were not appropriated until this year when $8 million were approved in my Budget to finance this part of the program for this fiscal year alone.

4. Initiation of a new automated water quality monitoring system and an expansion of State research in water pollution control problems.

5. Vigorous enforcement of the State's new laws against water pollution. Significant legislation which I recommended was unanimously adopted by the recent session of our Legislature to streamline and quicken the pace of enforcement.

This is a program which will indeed enable us to move on a broad front against pollution. It will permit us in six years to move throughout the State to eliminate a problem that has been building up for over a century, including the elimination of all pollution by New York State in Lake Erie.

As this Nation has been swept forward in a tide of urbanization and population growth, local governments have been faced with increasing financial responsibilities and burdens in essential service areas such as education. While local financial burdens grew, the need for water pollution control facilities was often low on the list of local priorities because water pollution often affects people and industries located downstream from those responsible for that pollution. The problem has been compounded by the fact that the Nation's water needs are increasing at the same time that wastes--actual and potential pollution--are increasing.

The State of New York has taken great steps in responding to urban needs; of our current budget, 58 percent--over $2 billion is paid to the localities as State aid. Despite this substantial financial underpinning, the burdens upon our urban areas are such that they have huge backlogs of need for waste treatment facilities.

Our Pure Waters program represents the kind of decisive action necessary to face up to the problem.

The importance of overcoming that backlog immediately and decisively cannot be over-emphasized, and of course is dramatized by this hearing. Not only will it permit us to move on a broad front against water pollution, but it will also permit us to solve the problem before the costs become unmanageable.

I think it is interesting to note that construction costs in this field increase about four to five percent a year. If we were to permit our existing backlog of needed works to persist for the next ten years, rising construction costs, together with new needs caused by increasing urban population and replacement of obsolete treatment plants, would double the cost of eliminating that existing backlog, bringing it to almost $4 billion.

We believe, therefore, that New York's comprehensive new program, building upon our previous efforts, is the solution to the water pollution problem in New York State. Through it, with the approval of the voters this November, we will end water pollution throughout the State, including the area with which this conference is specifically concerned.

Thus, the State action needed is under way.

With specific regard to this Federal Enforcement Conference, the extent of "interstate" pollution from New York (the specific problem of the Conference regarding New York) is very small in comparison to the pollution from the "upstream" states. The great bulk of existing pollution from New York from this area does not add to "interstate" pollution of the Lake and thus is "intrastate" in nature and will--under the new State legislation--be dealt with and eliminated if the bond issue is approved by the voters this fall. Senator Robert Kennedy and Representative Richard McCarthy have suggested that I request that the concern of the Conference be extended to cover New York's "intrastate" pollution problem in the Niagara Frontier.

In a joint letter dated July 15, the Senator and the Congressman said and I quote:

"Under the law, the Federal enforcement authority can be invoked with respect to intrastate pollution only on request of the Governor of the State. Thus, New Yorkers will not receive full benefit from this Conference unless you decide to request federal enforcement."

This statement is extremely misleading, ladies and gentlemen, to say the least. The fact is, however, that there would be no benefit to New York in terms of its intrastate pollution problem from such Federal Enforcement. We would receive no extra financial assistance. We do not need Federal legal assistance, and indeed such Federal enforcement activity could only serve to duplicate and hinder State action, already under way, confuse and diffuse responsibility, and thus delay the achievement of the real goal--clean waters.

Both the Senator and the Congressman attended the New York State Congressional Delegation meeting which I called, and are fully familiar with New York State's action program. Both of these gentlemen know that New York State now has the power to enforce and the comprehensive program to carry it out, if the voters approve the bond issue this fall and there is every indication that the voters will approve the bond issue. Both of these gentlemen also know that New York's share of existing Federal funds is only $5 million per year as compared with our State's needs of $1.7 billion.

What the Senator and the Congressman should be doing is working in the Congress to increase the Federal appropriations and to eliminate the provisions in the present law which short-change New York and the other industrial and urban states.

The necessary Federal commitment is yet to come. As I mentioned earlier, twice this year I have appeared before committees of the Congress--the Blatnik and the Muskie Committees--to urge the Federal government to assume its full 30 percent share of the cost burden in partnership with the state and localities as called for under the existing basic legislation, and 30 percent of the cost in New York State is $500 million. That is what we hope to get from the Federal government. At the present rate, it would take about 50 years, and we can't wait, ladies and gentlemen. We've got to move and act now. I have suggested a number of changes in the present construction grant program under the Water Pollution Control Act, which would result in achieving this goal. These include:

Allocation of total Federal funds among the states solely on the basis of population. We now get about 5 percent of the total Federal funds which is $5 million on a $100 million appropriation. We have 10 percent of the population and pay a good deal more in percentage of taxes. We would be happy to get 10 percent on a population basis, and if then the appropriation were increased to a minimum of $250,000,000 instead of $100,000,000 that would give New York $25,000,000 a year.

If we were allowed to pre-finance, that is, we'd pay and do the job now and collect each year $25 million from the Federal government as we can do under the Interstate Highway Program, then in 20 years, the Federal government at that rate, $250 million a year--$25 million to New York, would achieve their $500,000,000 share which is 30 percent of the cost in New York State.

Now what I've recommended is that the Federal government also amend their present law and make provision for an extra Federal grant where states provide grants to localities for construction of eligible projects to provide a full 30 percent Federal share, without regard to limitations.

Another revision, I've recommended provision for Federal reimbursement to a state from future Federal appropriations where such a state advances all or part of the Federal contribution to costs on eligible projects, and an increase in the yearly authorization for the Federal program from its present $100 million to at least $250 million.

I have also suggested a Federal tax incentive, similar to New York's under the Federal Corporate Income Tax to encourage and help industries in constructing the treatment facilities needed to end industrial water pollution where industrial wastes are not included in municipal systems. I might say there on this question of industrial wastes, that while a great many people think that industry is largely responsible for the pollution, in New York State the cost of correcting industrial pollution is around $67 million, whereas the cost of correcting community pollution is $1.7 billion, so that our industries have done a pretty good job. The incentive which I've recommended will help to clean up the last steps with the new enforcement provisions that the Legislature gave us.

In making these suggestions in Washington I have had a most interested reception. But their implementation by Congress will require some real and sustained effort by our Representatives in Washington as well.

I am convinced that this kind of national action as I suggested would provide the basis for a realistic solution to the mounting national problem, making the Federal program truly responsive to the national need, and go far to encourage states to assume their responsibilities under the Federal system.

In summary, the huge backlog of construction needs stands as a barrier to efforts to end water pollution. The State of New York is taking action--it has embarked upon a massive program to overcome this backlog, knows specifically what its program is, and intends to solve it.

The needed Federal action is a substantial Federal financial commitment in a Federal-state-local partnership program of immediate and decisive action--not simply to deplore water pollution, but to end it, with the funds that are necessary to build the plants.

Mr. Chairman, gentlemen, I'd like to thank you for your presence here and to say that by your presence you focus public attention on the problem and generate public support. I am confident that this conference which you have called will be an important factor in awakening increased public understanding and interest, so that when the issue comes before the public this fall, in November on our ballot, I have every confidence that the public, the voters of New York, will support this $1 billion bond issue. I am hopeful that it will not only be effective in New York, but will stimulate other states to take similar action and encourage the Federal government to do likewise in terms of the magnitude of the Federal financial effort.

Thank you very much indeed. (applause)

CHAIRMAN STEIN: Thank you, Governor, for indeed a comprehensive thinking on New York's position. I think that when we have people wanting to clean up pollution, and we just have a difference in detail, we can achieve these results.

Governor, you know if you stay around long enough, almost everyone is your boss or your ex-boss. I remember when you were my boss as Under Secretary--that's when you developed this legislation that we are applying here now and these enforcement procedures.

Are there any further comments or questions? If not, I understand that Dr. Ingraham, who is with the Governor, would like to make his statement now.

May we hear from Dr. Ingraham?

DR. INGRAHAM: Mr. Chairman, conferees, ladies and gentlemen, I am Hollis Ingraham, Commissioner of Health of the State of New York, and I should like to describe to the conference the powers and programs of the State Health Department in combatting water pollution not only on Lake Erie, but in the rest of the State as well.

In New York State, the policy-making coordinating agency for all State resources is the State Water Resources Commission. Our State Conservation Commissioner, Mr. Harold Wilm, who is Chairman of the Water Resources Commission, will testify here today. The Health Department is the agency which administers the State's Water Pollution Control Program within the framework of policy established by the Water Resources Commission. As Commissioner of Health, I am also a member of the Water Resources Commission.

The Commission is responsible for classifying and reclassifying waters as to their best social and economic use. The State Commissioner of Health is responsible for enforcing the law "to abate existing pollution and to prevent future pollution." To meet our responsibilities, we have created a water resources program within the Health Department that in size, scope and the quality of personnel ranks among the leading water control programs in the Nation.

Our Water Resources Bureau is organized to deal with both the immediate problems of pollution and, equally vital, to carry out long-range, area-wide planning to insure that our results are not sporadic, piecemeal or short-lived.

The comprehensiveness of our approach is perhaps suggested by the programs operating within our Bureau of Water Resources. These are research and development, planning and evaluation, municipal and industrial pollution identification, water pollution control enforcement and water supply services.

Let me summarize quickly the major outlines of the Department's water programs. This year, we completed an exhaustive survey of the State's 54,000 square miles of surface waters. By the end of the year, all these waters shall have been classified according to their best usage. We have completely abated more than 600 sources of pollution through voluntary compliance, or court actions since the Water Pollution Control Act of 1949 came into effect. We have identified 700 industrial and 1200 municipal sources of present pollution. We have set abatement schedules to end pollution from all of these sources. Together with the State's Attorney General, we are carrying out numerous pollution hearings and court actions in cases where voluntary efforts have not availed. We exercise preventive action by requiring the submission and approval of plans for new waste outlets or modified disposal systems.

Through our investigations we originally identified 132 sources of pollution in the Erie-Niagara Drainage Basin. The Health Department has succeeded in completely abating pollution from over 36 percent of these sources. Another 12 percent have been partly curbed. Since 1957, $17 million has been spent in Erie County alone for trunking and treatment facilities. Four million dollars more are committed for construction. We still have 62 municipal and 21 industrial sources of pollution in this basin, of which 30 are considered heavy polluters.

Just as important as the enforcement of the pollution abatement, we have also instituted positive programs to help communities and industries plan their waste treatment systems with an eye to the future purity of our waters. For example, we pay the full cost of studies to encourage the planning of comprehensive water supply and sewage treatment facilities along the sensible, more economical lines of drainage basins. Eight such studies in the Erie-Niagara Basin are now among the 110 that the State is currently supporting. We are providing the technical services of State experts to assist our local health departments with special pollution problems. We have under way, a vigorous program of research to find more efficient and less costly treatment methods and to find ways to treat difficult and unusual wastes.

Governor Rockefeller has already described to you our State assistance to localities and financial incentives to industry to stimulate the construction of sewage treatment facilities. Mr. Hennigan who directs our Bureau of Water Resource Services is here today as a participant, and will give you a more complete picture of what we are doing, and what we propose to do as a State deeply committed to rescuing our waters from pollution. Perhaps I can put that effort into some sort of perspective by saying that our State level water planning and pollution abatement services are now a $15 million annual item in the State Health Department budget.

But this is not enough. Governor Rockefeller's statement clearly identified the key to decisive pollution abatement, which is to help communities and industries meet the staggering expense of building sewage treatment facilities. The unanimous enactment of the Pure Waters Act by our State Legislature demonstrates the willingness of New Yorkers to accept a $1.7 billion price for cleaning up our waters.

One of the issues before this conference seems to be whether or not the pollution of Lake Erie is interstate. This issue involves technical definitions and arguments can be made for either case. However, I believe that this issue does not rival the far more relevant question as to how we go about abating the pollution. Lake Erie is admittedly polluted and New York is admittedly one of the several States contributing to this condition, even if, as Governor Rockefeller mentioned, we contribute less than 1 percent of the total pollution load to Lake Erie.

Our objective is to abate the pollution that emanates from sources in New York State, and we ask the Federal Government to become a fuller financial partner in helping us meet this goal. We know our pollution problem. We know what must be done to end it. And we know how much it will cost. The link that chains these factors together into a successful attack on pollution is financing.

We possess within the State the organization, the skills and, most crucial of all, the will to end water pollution. Of course, we will always welcome the excellent technical and consultant assistance of the Public Health Service when offered on a true partnership basis. We hope to continue to enjoy the help of the Service, but at this point, the decisive force needed to defeat pollution is greater Federal financial assistance in line with Governor Rockefeller's recommendations.

By continuing its technical cooperation and by providing increased financial incentives to municipalities and industries, the Federal Government can create a model partnership with New York State that will point the way to cleaner waters throughout the Nation.

This ends my formal presentation, Mr. Stein. I'd merely like to say that there has been great interest in this conference--so much so that we felt it was impossible to accede to the requests of all those who wished to speak here today, and I thought that in view of the fact that on June 17th, Senator Muskie held a conference here in this same City, and reviewed in great depth the problems of pollution in Lake Erie, of which all segments of the population had an opportunity to testify, that it might be desirable to incorporate into the proceedings of this conference the testimony given at that time. I make that merely as a suggestion that Mr. Hennigan perhaps could enlarge on.

CHAIRMAN STEIN: I wonder if we could keep that under advisement for a while--to look at the size of that record to see whether we want to make it an exhibit, or part of the transcript.

DR. INGRAHAM: Merely a suggestion, Mr. Stein, for your consideration.

CHAIRMAN STEIN: Of course, Dr. Ingraham, you know that under the law, you fully control New York's time and the invitees from the State. You also know that as conferees we are here and are ready to be here, as long as you have invitees who you feel have relative statements and you want to put them forth before us. In other words, we are not imposing any time limitations.

DR. INGRAHAM: Yes, sir, and we have invited a number of participants who have accepted the invitation. I thought this might merely be a way in which absolutely complete coverage might be attained, if it is not attained in the course of this conference.

CHAIRMAN STEIN: We will take that up with Mr. Hennigan, if we may.

Are there any further comments or questions of Dr. Ingraham? If not, thank you very much, Dr. Ingraham, for your very perceptive statement. We certainly appreciated it, and I'm sure it is going to add to the conferees' deliberations. Thank you. (applause)

Before lunch, we would like to call on Dr. Harold Wilm, Commissioner of Conservation of the State of New York, who has a statement for the conferees. Dr. Wilm?

DR. WILM: Chairman Stein, it's nice to see you again, and your associates at the front table.

Ladies and gentlemen, my paper can be very brief for one very good reason: I have been preceded by my boss, the Governor of New York State and by Dr. Ingraham, who have explained the responsibility of the Health Department in connection with the Water Resources Commission.

I'm appearing as the Chairman of the Commission. As such, I am not going to try to duplicate what Dr. Ingraham has already told you. But I would like to expand just a little bit on what was said, to indicate some of the other responsibilities of the Commission, aside from water pollution control, simply because these other activities do relate directly on water pollution control, through the relation of water to all its uses, including quality.

The establishing of water quality goals is an important part of the concentrated study efforts that have been undertaken by the State within the last three years in the Erie-Niagara Basin and in other areas of New York State.

In this State, we have the legal and administrative framework for effectively handling and coordinating activities and programs relating to all aspects of water resources planning, development and control. Policy-making for these activities is centralized in the Water Resources Commission, which is composed of the seven chief executives of the Departments of Agriculture and Markets, Commerce, Conservation, Health, Law, Public Works and the Office for Local Government, and four laymen advisory members who represent agriculture, sportsmen, municipal corporations and industry. The Office of Local Government was added to the Commission just this last year because of the very great strength of local governments in New York State, particularly in comparison with many other States. The Conservation Commissioner, as you know, is Chairman.

In connection with water quality, it might be emphasized that the Water Resources Commission adopts the standards and classifications which apply to all the waters of the State. These are controlled by the Health Department in consultation with other departments, and then before they are made rules of the State, they have to be approved by all the voting members of the Commission.

In the case of all other water resource activities, some single department of the member departments carries out the policies in the water quality field. The Health Department enforces the standards and classifications and takes all necessary action in connection with water quality and water pollution control.

This is a powerful mechanism. It's a very good mechanism in the sense that it ties together the interests of the Federal-State departments and various laymen interests in a single Commission which passes upon the policies executed by individual departments, such as the Health Department.

I'd like to bring to your attention State planning activities to demonstrate that New York has a complete water resources program within which water quality goals can be established and continually protected: (1) The Water Resources Commission is charged with evolving a Statewide plan for comprehensive development of the State's water resources. Therefore, the Commission is participating in planning jobs involving about one-half the State's area already in Federal-State coordinating committees, in which the Water Resources Commission works directly with the Federal agencies; (2) The Delaware River Basin where we have an interstate Federal contact with very broad power over the water resources of the Delaware River Basin. The Commission, in this case, is composed of the Governors of four States, and a representative of the President - one representative of the President. He is required by law to coordinate all the Federal activities in the Delaware River Basin; (3) Intrastate regional board studies under Part V, Article V of the New York State Conservation Law and finally (4) broad-scale water resources studies of ten regions of the State with the State Office for Regional Development and also in cooperation with the Federal Housing and Home Finance Agency.

Of particular interest here is the State-financed regional board study of the Erie-Niagara Basin, which embraces about 2,000 square miles in a four-county area; this includes about 84 percent of the total area of the State which drains into Lake Erie (roughly 5 percent of the total geographical area of the State is tributary to Lake Erie). The board, constituted in January 1963 by the Water Resources Commission and composed of seven highly qualified local leaders residing in the basin, is responsible for evolving a comprehensive plan for the development of the water and related land resources of this four-county region, centered around Buffalo.

I might add in this connection that we requested the Secretary of Agriculture and the Secretary of the Army to assist us in this case, rather than our assisting the Federal people. The Secretary of Agriculture responded that under Public Law 556, the Department of Agriculture is already empowered to cooperate directly with State and local agencies such as this four-county board, and he would be very glad to supply personnel and finances, if granted by the Congress. Of course, we have been talking to Congress to see that the Secretary of Agriculture gets a little bit of money.

When we approached the Army on the same subject, we found that while they would be very happy to cooperate with us, although we surprised them a little bit, that they needed to have a little additional language in the Flood Control Act of 1965, which would empower them to cooperate with the local agencies, such as this regional board. At the request of Congressman Leo O'Brien, the Chairman--the ranking member of the Interior Committee of the House--incidentally, Congressman O'Brien asked the Army to draft some suitable language, which has now been introduced into the Congress.

For the first time you might say, two great Federal agencies are cooperating with a local board with leadership by the State in a really cooperative planning endeavor starting right now in the counties most concerned.

The plan for the Erie-Niagara Basin will include provisions to meet short- and long-range needs to satisfy diverse water requirements: municipal, industrial and agricultural water supply; water quality management, including low-flow augmentation; water-based recreation; fish and wildlife enhancement and management; navigation; hydroelectric power; erosion and sedimentation control; related land use and land treatment; and others.

Estimates of the benefits to be derived from the varied project functions will be developed for various alternative schemes. All practicable, alternative means of solving the major water resources problems of the region are being studied to determine the most economical and advantageous solutions. Water quality management, including pollution control, is a basic consideration in the evaluation of the possible solutions. The comprehensive plan for the Erie-Niagara Basin is expected to be completed sometime in 1968.

Without the cooperation of the local people at every stage of this complex planning process, any efforts to conserve, control, utilize, develop and manage the water resources of a region or a river basin are likely to fall short of the end objectives. In other words, we believe in planning from beneath with the assistance of the higher levels of government, rather than planning from the top with the assistance of the lower levels. This is quite a radical change in our philosophy.

The Erie-Niagara Basin Board provides the local participation that is necessary to achieve successful planning. Water quality goals appropriate for the many needed and desired uses is basic for our economic and social well-being and requires consideration of many aspects which clearly are beyond the area of health alone. We have in operation here, not only the mechanism, but an actual program under local leadership, participation and financing to achieve these goals.

Similar intrastate regional board studies are now in progress in other river basins of the State. In all of these, as well as those of interstate river basins of concern to New York, we welcome the participation of the U. S. Public Health Service, and other Federal agencies as collaborators with the State in planning the use, control and development of the waters of the State. We believe that Congress has clearly established the need for this teamwork, and that water quality goals in any area of study can be established realistically only when local, State and Federal agencies work together to insure collaborative consideration of all significant interests.

Thank you. (applause)

CHAIRMAN STEIN: Thank you, Dr. Wilm. As always, you have given us a very perceptive and professional analysis of the problem, and I'm sure this will be very helpful too.

Are there any comments or questions of Dr. Wilm? If not, thank you very much, Sir.

We will recess for lunch and reconvene promptly at 2 o'clock.

(Conference recessed for lunch)

CHAIRMAN STEIN: Are we ready to reconvene? Mr. Premetz, will you continue please?

MR. PREMETZ: I guess we'll get to Part II of the saga of Lake Erie now.

I did remember one thing, Chairman Stein. I think in Cleveland you told us that if we didn't identify ourselves by record, our remarks would be listed under "Anonymous", so I guess my remarks this morning were listed under "Anonymous".

CHAIRMAN STEIN: No, they were listed under "Miscellaneous".

MR. PREMETZ: But for the record, my name is Ernest Premetz and I'm Deputy Director of the Great Lakes and Central Region of the Bureau of Commercial Fisheries, U. S. Department of the Interior, headquarters at Ann Arbor, Michigan. Out of Ann Arbor, we cover an eighteen State area in the Great Lakes and Central part of the country, so we are concerned with pollution problems in a variety of environments--all of our major river basins, and the Great Lakes area. With that, let's get to the point where we stopped this morning, and that was this matter of water quality standards.

As I mentioned, we cannot consider a single set of water quality standards as being applicable to all uses. For example, water that might be suitable for industrial purposes may not be acceptable for human consumption and, as is the case, would be even less acceptable to fish and wildlife.

In dealing with the suitability of water for fish, we are not concerned merely with the question of whether fish can survive in the water. We must consider whether the entire environment is suitable for satisfactory reproduction and growth of fish. A case in point is what is happening to lake perch in the western end of this Lake. Lake perch are extremely abundant, and yet they are not contributing very much to either the commercial fishermen or sportsmen, simply because they are not growing. Where it used to take them a couple of years to reach the legal size, the size that the commercial fishermen and the sportsmen wanted, it now takes them three and a half years to reach this same size. In fact, these fish are dying of old age in the Lake before they can be used by the people living on the shore.

This is one of the types of effects that we have from pollution. It need not necessarily kill the fish. It can so alter the environment that it makes it impossible for the fish either to reproduce or it changes the fish to the extent that it does not grow fast enough to contribute to the people that wish to make use of the resource.

There have been some rather dramatic decreases in the abundance of several important fish species. These species, of course, are harvested both by the commercial fishing industry and end up on the tables through your restaurants, and through your supermarkets, and also are utilized by the sportsmen. Gone from Lake Erie are the keystones that supported a healthy and lucrative industry, second to none in the years 1935 to 1958--blue pike. All of you remember blue pike in this part of the Lake. Walleyes, whitefish and yellow perch stocks have dwindled to insignificance or have changed character so much that their contributions to the welfare of the fishing industry are almost nil.

For example, following the initial collapse of the blue pike and walleye production in 1958, fisheries for both species continued to decline to insignificant levels. Blue pike production dropped from some 6.8 million pounds worth $1.3 million in 1956, to 200 pounds worth $120 in 1963. At the present time, to catch a blue pike is quite a task. In fact, it's becoming a biological rarity in Lake Erie. Now what happened to blue pike? Our scientists feel that gradually we have continued to pollute the waters at the eastern end of the Lake. This pollutant is in the silt that is deposited on the bottom. The blue pike deposits its eggs on the bottom. These eggs do not survive. Without survival, the entire stock of fish is disappearing.

Now let's take the walleye. This was the key species in the western end of the Lake. In 1957, we had over 5 million pounds worth $1.4 million. In 1962, 433,000 pounds worth $186,000. The situation has further deteriorated. There is very little of it caught at all now.

In less than eight years, the fishing industry in U. S. waters--this is U. S. waters alone of Lake Erie--lost dockside values in these two species alone of $2.5 million annually. This is without considering any other species. We don't know how much was lost due to the decline in sport fishing. I imagine it was considerably more than this amount. So, we've got a serious problem facing us. Other usable fish in the Lake are now threatened to the extent that the stability and development of stocks are extremely undependable and beyond production. We have a difficult time trying to predict anything, because things change so rapidly. A lot of people can't even keep up with it.

I have other things that are going into the record as far as what is happening with some of these fish species. I won't repeat them here, but the one point that I do want to make is that all of the information we have at hand now indicate that pollution is having a direct effect on fish and aquatic life in the Lake, and this pollution threatens extinction of many of the more desirable fish in that Lake.

Now you've heard a lot of talk about dissolved oxygen and about the fact that we have oxygen depletion in the Lake. This was first pointed out, as far as Lake Erie is concerned, by Ohio State University in September of 1953. They found, at that time, that in less than five days the dissolved oxygen levels reached .7 to 1.2 parts per million in many areas. Unfortunately, they didn't follow through with observations, so we don't know whether this situation which we found in the western basin also existed in the central basin at that time. However, studies that were made in the central basin as early as 1929 showed oxygen deficiencies below 65 percent saturation and in some areas below 40 percent during the months of July and August.

It's not unreasonable to assume that serious oxygen deficiencies in the central basin occurred regularly and even more regularly in the western basin. Two phenomena always accompany these oxygen deficiencies in Lake Erie. A thermal stratification is established and the zone of oxygen deficiency is always near the bottom; so much so that our people working in this area had to develop special samplers to demonstrate the vertical extent of the affected column of water. Frequently, the thermocline and oxygen-deficient layers are less than two meters thick, so it's right down to the very, very bottom. But this is sufficient to kill off a lot of the eggs of the fish that are spawning in the Lake.

Since 1953 extensive oxygen deficiencies in the middle and frequently the western basins of Lake Erie have occurred affecting thousands of square miles. One time there we found an area of 4,000 square miles that was devoid of oxygen. This condition has been detected every year since 1958, and it appears that its regularity of occurrence is becoming accepted as a seasonal phenomenon. We haven't noticed this serious situation in the eastern end, although we are now getting indications that we are going to get this sort of situation here. We have a different situation here, simply because this is the deeper end of the Lake, and it takes a little more time to have this sort of an effect, but as we continue to dump pollutants in our waters, we create a greater and greater oxygen demand and we come closer to a state of oxygen deficiency in the water.

Along with oxygen deficiency we have had several changes in the chemistry of the Lake. I won't go into this, because a lot of the same material is covered by the Public Health Service in its report, but I have submitted the record we have--the comparisons we have of 1907 with 1961 to show the trends that have occurred during this period.

As I mentioned, the situation we are facing in Lake Erie is difficult to deal with employing the usual surveys, techniques and criteria for detecting and measuring pollution. Scientists that have worked in this field gain most of their knowledge on pollution from work on rivers, streams and small bodies of water, which are nothing like the larger lakes. Actually, most of them have very little knowledge of the effects of pollution on large lakes, such as Lake Erie. Nevertheless, they have been able to mount a fairly substantial program in more recent years, and now we feel that ample evidence exists to demonstrate that Lake Erie has changed appreciably, as a result of pollution, and this is having a serious effect on the fish stocks in the Lake.

I am adding here also a little bit of a statement to try to tell you a little bit about what happens in this aging process and to explain this term eutrophication that's used. But I won't go into it at this time, because I believe Dr. Tarzwell is going to be on the program to give you a little bit of a short course on eutrophication and pollution. He did a fabulous job in Cleveland, and I think a lot of the people went away knowing a bit more about some of the terms that were tossed at you, which is very, very difficult for most people to understand.

Except for the oxygen deficiencies that have been noted, some people say that the limnological changes have not been highly critical. However, to make our consideration of this whole matter more comprehensive, we must add at least three additional factors that are definitive where fisheries are concerned.

One is, there have been certain environmental changes, due to nature. For example, in the last 45 years, the mean water temperatures in the Lake have risen almost 2°F. This does affect some fish.

The sedimentation rate has increased markedly, and these sediments have become more active and complex chemically, with the passing of time. Our scientists feel that the sediment itself is our basic problem, as far as fish are concerned. All of the constituents, all of the chemicals, all of the toxicants, all of these things that draw on oxygen are contained in this sediment, and there is a terrific amount of it in the Lake. How this would ever be removed, we don't know--but at the same time, we don't want to contribute more to it, and continued practices of the type we've had are going to add more. It is going to create a more extreme oxygen demand here, so we've got to put a stop to these things. To find out just how this sediment acts in water that contains proper oxygen, we have run some experiments in the laboratory. And, for example, if we were to take five grams of the sediment from the bottom of Lake Erie and put it in a 250 ml water sample, all of the oxygen in that water sample is removed in less than five minutes. Now what we do in this column which we've developed is to try to simulate what happens in nature. So you can see when conditions are right, this sediment can draw the oxygen right out of that water and create an environment entirely devoid of oxygen, which means that fish that are there can't live--that eggs that are there can't survive--the younger fish that are there can't survive. So these are the problems we face.

All of you in this area--not so much here perhaps as in the western area or part of the Lake--can remember the swarms of mayflies that were seen in all of our cities and it created quite a nuisance. You don't see them any more. They're gone. The pollution has actually affected this particular insect, the mayfly, and this mayfly, of course, was one of the chief foods of various species of fish. Without this food, many of these species have not been able to adjust.

Some of our people feel that one of the reasons that the yellow perch does not grow as fast as it used to is because it has to feed on other things now--sludgeworms, for example, that are found in the Lake, rather than the mayfly. Therefore, it can't grow as quickly.

I don't want to go into a great deal of detail here. I think I've talked long enough, but you can see that this is an extremely complex and involved matter. That the steps that are being suggested today are only first steps, based on our present knowledge, that there is still a great deal more work to be done, and a great deal more research that has to be done, before we can suggest other steps--that all of this is going to take a spirit of cooperation on the part of everyone that's interested in doing something about preserving this resource. It's bigger than all of us. Let's face it. We can't tackle the job alone. I'm sure that Public Health Service can't tackle it alone. I'm sure the States can't tackle it alone. I think we've all got to work together, not only on this first step, but on the steps beyond this and this is going to take many, many, many years to do, and I hope, in time, that we're going to have a Lake that is useful again to man, and that can again contribute to our welfare.

Thank you all for being such a kind audience and I certainly appreciate having had the opportunity to chat with you.

CHAIRMAN STEIN: Thank you, Mr. Premetz. Are there any questions or comments?

MR. POSTON: I would like to ask Mr. Premetz a question. He referred to DDT in the Antarctic fishery and in seals and I wondered if he was trying to make the point that the fishery in Lake Erie was mobile and moved around all over the

Lake, to the extent that the fishery is affected by pollution no matter whether it is over the whole Lake, or whether it is in a stream.

I noted after our boat trip yesterday we did see a lot of chemical wastes in the Buffalo River and while I know the fishery wouldn't move up the Buffalo River and continue to exist, I wondered if these wastes over in this area might affect the fish which would be caught up in another part of the Lake? Would you care to comment on this?

MR. PREMETZ? You're putting me on the spot here. But, as I mentioned, as far as we can see, the pollution is pretty widespread and we really don't know where these things we put in the water may end up.

Really, not to evade the question asked, but perhaps consideration of framework of our responsibility, that is, fish itself, if we're thinking in terms of Lake Erie and all of the States along Lake Erie, anything any one State does within its particular State boundaries which affects fish and their ability to survive or reproduce affects people in adjacent States. In other words, let us hypothetically say that blue pikes spawn in New York waters; due to a severe pollution condition the eggs don't survive. These fish, in turn, migrate to Canadian waters, Ohio waters, Pennsylvania waters and then perhaps we have a situation where all of the States are contributing, to some extent, to a decline of a particular resource. Is this what you're getting at, primarily?

MR. POSTON: That's right.

We appreciate the cooperation and assistance that we have had from the Bureau of Commercial Fisheries and our people have exchanged information with them and are very appreciative of this cooperation with your agency.

MR. PREMETZ: Well, we enjoy working with the people in the Public Health Service as well, and you have one boy (and I used that advisedly) that we'd like to have over on our team right now, and that's Dr. Tarzwell, because he's the granddaddy of them all when it comes to pollution research as it affects fish, and you're going to hear from him a little bit later on.

CHAIRMAN STEIN: He's our Chief Coach. He's just incredible.

MR. PREMETZ: We'll listen to him a little more, too.

MR. HENNIGAN: Mr. Premetz, I have one question. Did you say that in 1953 studies at Ohio State University revealed a critically low level of dissolved oxygen in the Lake?

MR. PREMETZ: In western Lake Erie, yes.

MR. HENNIGAN: It's interesting that in this same period, '53, '54 and '55, in fact, the walleye population in Lake Erie was at one of its high peaks. What is the relationship here?

MR. PREMETZ: Well, this is hard to explain. It may very well be that this oxygen demand was in an area where it did not affect that population. These were isolated cases in the early year. When we talk about '53, this is one spot where this was noted. In later years, and particularly in recent years, we have gotten situations where, at one time, we have 4,000 square miles devoid of oxygen. This has a serious effect. This problem has been growing over a number of years, and is getting more serious each year.

CHAIRMAN STEIN: Are there any further comments or questions? If not, thank you very much, Mr. Premetz. (applause)

We just have one more person out of order, but because we have had so many this morning and this afternoon, I might indicate to you what the order is. I should give you my philosophy first. An agenda is something to help us run a meeting or a conference and we're not slavishly governed by an agenda. Obviously, when you have Governor Rockefeller or Senator Kennedy's schedules to meet, adjustments have to be made.

Now, generally speaking, when we proceed we would first take the Federal Government presentation and we would call on other Federal agencies and then we would call on the various State agencies for their invitees. This is what we will do after the next presentation is made.

We are privileged today to have Dr. Wilbar, the Health Officer of Pennsylvania, with us. Dr. Wilbar has to leave today, and will have an alternate, Mr. Richard Boardman, sitting in for him when he leaves. In order to facilitate Dr. Wilbar's meeting his very busy schedule, we are going to ask Dr. Wilbar to make his presentation now, and then we will adhere to the format of the original agenda. Dr. Wilbar?

DR. WILBAR: Mr. Chairman, fellow conferees, and ladies and gentlemen, I am Dr. Charles Wilbar. I'm Secretary of Health of Pennsylvania, and by virtue of that office, I am also Chairman of the Pennsylvania Sanitary Water Board, so in a way I have the responsibilities that both Dr. Ingraham and Dr. Wilm have in the State of New York.

Since we are very cognizant of the roll call here of the conferees, I would like to point out that the Pennsylvania Sanitary Water Board is meeting tomorrow. It is a scheduled meeting with a large agenda, and I must get back to do this, sleeves rolled up, as part of our regular program in Pennsylvania of water pollution control, and in my stead, Mr. Richard Boardman will sit in on the conference. He is Sanitary Engineer in charge of water quality in the Pennsylvania Department of Health.

Our program in Pennsylvania has a good deal of similarity with that of New York State, and I agree very much with Dr. Ingraham, in that there is a particular need from the Federal Government for research and technical aid and particularly grants-in-aid finanically, to help meet the great costs of some of these programs.

The enforcement powers, I think, are quite adequate in most of the States. We have 100 men, full time, trained in the water pollution program, in the Health Department of Pennsylvania, and a score or so men in the Departments of Mines and Indoor Industries who are full time in this program in connection with the strip mines in the bituminous areas. We also have a law under which the State provides 2 percent of the cost of a treatment plant each year, after the plant has been built. The cost now to the State is nearly $8 million per year for this. This is really a maintenance factor and the municipality or the authority owning the plant gets this money for an indefinite period of time.

We have had a strong water pollution law in the State for over 50 years now, and it was strengthened two years ago and there's a bill in now to strengthen it further, in regard to acid mine drainage.

We do classify streams and have for some time. I think that we have had a rather successful program with more than 85 percent of our industries and municipalities which are under orders to treat their wastes adequately and cause us no new problems.

We in Pennsylvania are intensively interested in Lake Erie. The Lake is an important source of public and industrial water supply, and it's a popular summer playground for Pennsylvanians, as well as tourists from other States. The Sanitary Water Board has, over the years, endeavored to protect this valuable resource from pollution by establishing a complete degree of treatment as the treatment requirements for all wastes discharged into the Lake and into its tributaries.

Because of the importance of Lake Erie in Pennsylvania's economy we support the need for the Public Health Service Comprehensive Study of the Lake Erie Basin, now going on. The abatement of water pollution is a complex business, and intelligent action must be based on comprehensive long-range planning in which all pertinent facts are considered.

The Pennsylvania portion of the Lake Erie Basin includes portions of Crawford and Erie Counties and encompasses an area of 512 square miles. Agriculture is one of the principal industries in the Basin. Grapes and other fruit crops and early maturing vegetables are the most important crops. Some heavy industry is concentrated in and near the City of Erie. The population of the Basin is approximately 260,000, of which about 140,000 live within the City of Erie.

Numerous small streams enter the Lake from the Pennsylvania portion of the Basin. The U. S. Geologic Survey does not measure flow in any of these streams on a regular basis. However, it has been estimated that they contribute an average flow of about 420 cubic feet per second to the Lake.

Uses of the waters of Lake Erie in Pennsylvania are many and varied. Recreational use of the Lake includes bathing at the many beaches, fishing and boating. The best known and most heavily used beaches are a series of broad sandy beaches in Presque Isle State Park near Erie. Yearly attendance at the park exceeds 3 million people. The estimated dollar value of this facility in terms of annual income to the area is $45 million.

Boating interest is evidenced by the numerous pleasure boats to be seen in the Erie City area on most summer days. Reports indicate that fishing, although less popular in recent years because of a decline in numbers of the more desirable game fish, is still a very popular form of recreation. Commercial fishing has also declined. Nevertheless, it still offers a livelihood or a supplemental source of income for some Pennsylvanians.

The Lake serves as a source of municipal water supply for the City of Erie and surrounding communities. Water is drawn from two intakes which extend several thousand feet out from the western shore of Presque Isle. The average water use for this purpose is approximately 39 million gallons per day. Water use exceeding 50 million gallons per day during the summer months is common. The estimated population served is 200,000. The remainder of the population in the Basin is served by private on-lot water supplies or by public water supplies which use tributary streams or ground water as sources of supply. Total industrial water use is about 220 million gallons per day. Most of this is used for cooling purposes.

All of the municipalities in the Basin which maintain public sewer systems are served by complete degree treatment works. Complete treatment is that treatment in which a minimum of 85 percent of the biochemical oxygen demand load is removed. It affects the removal of substantially all suspended and settleable solids as well as the removal of oils, greases, acids, alkalis and of toxic, putrescible taste and odor producing substances. A number of schools and business establishments in the Basin do not have access to public sewers and therefore must provide complete degree sewage treatment prior to discharging to streams. A tabulation showing the status of sewage treatment in the Pennsylvania portion of the Lake Erie Basin is attached to copies of this presentation.

All of the industrial establishments in the Lake Erie Basin are meeting the Pennsylvania Sanitary Water Board's waste treatment requirements or are making satisfactory progress towards meeting this goal. The latter group has submitted time schedules for the necessary corrective action and are on schedule. The tabulation of the industrial establishments in the Basin indicating their water pollution control status are attached to copies of my presentation.

An important case presently making satisfactory progress is the Hammermill Paper Company plant at Erie. A change in the company's manufacturing process about ten years ago created a waste which is not amenable to treatment by conventional methods, and created a serious pollution problem.

After a great deal of research the company has chosen to dispose of its strong waste in deep wells. One of the two planned wells has been in operation for more than a year. This is about 1200 feet deep. On July 20 of this year, the company received a permit from the Sanitary Water Board to begin operation of its second well. It is twice as deep as the first one. These wells by this time should be effectively handling two million gallons per day of highly concentrated pulp mill waste. These wastes constitute most of the company's high BOD waste. All other wastes from the mill receive treatment prior to discharge to Lake Erie. In the near future, we plan to evaluate the effect on lake quality of the plant discharge to determine if additional pollution abatement steps are necessary.

Water quality in the eastern end of Presque Isle Bay has been adversely affected by discharges of both sewage from combined sewers and of industrial wastes. Overflows from the Erie City combined sewer and storm drain system during the periods of heavy precipitation constitute a source of pollution to the Bay. The City has intensified its preventive maintenance program to eliminate unnecessary discharges from combined sewers. Because of the very nature of combined sewer operation we will continue to have periodic discharges of wastes to the Bay and some of its tributary streams during the periods of heavy precipitation. The City has estimated that to separate storm and sanitary sewer systems in order to eliminate periodic discharges would cost $20 million.

Discharges of industrial wastes to the Bay through city storm sewers and streams tributary to the Bay caused a series of fish kills in Presque Isle Bay during the summer of 1964. A cooperative survey made by the Pennsylvania Department of Health and consultants for the City of Erie has pinpointed these sources of pollution and most of the discharges have been abated. Satisfactory progress has been made toward abatement of the remainder. We plan to study the effect of these discharges on the Bay after planned abatement work in this City is completed in order to determine if any additional action is needed.

The quality of the streams entering Lake Erie from Pennsylvania is generally good. The only exceptions are Cascade Creek, Mill Creek, and Garrison Run, which receive the combined storm and sanitary sewer discharges mentioned above. General compliance with Sanitary Water Board waste treatment requirements and the rural nature of much of the watershed combined to preserve the quality of the other Pennsylvania streams at a high level. Conneaut Creek, the only interstate stream of significant size, receives several treated waste discharges, but quality is good at the State line.

Water quality in the Lake proper has been generally good except for a zone immediately east of Presque Isle. The effects of the Hammermill Paper Company's discharge which enter the Lake in this shallow cove have been readily apparent. The dark brown color and propensity to foam have been obvious to the casual observer. Winds from the northeast, which are infrequent and opposite to the prevailing wind direction, have several times in the past caused the waste to concentrate in the cove and in Presque Isle Bay to the extent that dissolved oxygen was seriously depleted and fish were killed.

Extensive sampling of the Presque Isle beach area for bacteriological analysis over the years has indicated acceptable quality on all beaches except Beach 11 at the eastern point of Presque Isle. High coliform levels at Beach 11 have been correlated with occasional winds from the east which carry the chlorinated effluent from the Erie sewage treatment plant in the direction of the beach. The sewage treatment plant discharges to the Lake through a submerged outfall about a mile from the Presque Isle beaches. Operation and control changes have been made at the sewage treatment plant in an attempt to eliminate this problem.

We have no information available to us that indicates that pollution of Lake Erie in relation to Pennsylvania is occurring from another State.

An indication of the eutrophication of the waters of the Lake is observed periodically in the Erie area. Heavy mats of algae are washed ashore creating nuisance conditions and discouraging bathing.

By way of summary and conclusion, significant pollution control progress has been made by the municipalities and industries in the Pennsylvania portion of the Lake Erie Basin. We will continue our program aimed at abating the remaining inadequately treated waste discharges in the Basin. We realize that effluents from complete degree treatment works and agricultural runoff contain residual pollutants that can adversely affect water quality. Nutrients which speed up the eutrophication process fall in this category. I might add parenthetically here that I think this is a most serious problem--this fertilization or eutrophication, due to excess of phosphates mainly, and we haven't yet seen scientific analysis of the proper long-term answer to this in this Lake or any other lake in the United States. There are a few small lakes in the United States that have completely disappeared due to eutrophication and this could happen to Lake Erie. We expect that the Public Health Service study report will indicate the effect of these nutrients on the Lake, where they come from, and how much it will cost the people in the Basin to abate this type of pollution.

We have no information that indicates that interstate pollution involving Pennsylvania is occurring in Lake Erie.

Pennsylvanians have devoted a great deal of effort toward abating pollution in our portion of the Basin. The economy of the Pennsylvania portion of the Lake Erie Basin depends upon preservation of lake water quality. We intend to do everything in our power to assure that water quality requirements designed to enhance the quality of the Lake are met, and I would like to add a supplemental statement at this time. We did receive five days prior to the opening of the conference the report from the Public Health Service. It takes a while to read it and study it, but I would like to say in addition to my prepared statement, I would like to comment on the recommendations made in the Public Health Service's report on Lake Erie.

Pennsylvania's water pollution control program already has requirements that meet most of the general recommendations. The specific recommendations in Part III of the report are apparently based on somewhat outdated information and it created a public relations problem for two industries in the Erie area. The two industries mentioned in the report, Hammermill Paper Company and Interlake Iron Company, were the subject of newspaper criticism by one of the Congressmen from the Erie area. He used the Public Health Service outdated and inaccurate information as a source, and the Hammermill Company has already taken the action recommended in the report and Interlake Iron Company has had effective solids and phenol removals for some time. It is unfortunate that information such as this was not checked more closely with our people prior to its published release. These companies have spent considerable sums of money to meet the Sanitary Water Board requirements and should not be unjustly criticized.

The City of Erie is already looking into the extension and enlargement of interceptors which would allow for the diversion of less storm flow to Mill Creek. The additional storm flow would be diverted to the sewage treatment plant, and discharged to the Lake, rather than to the small tributaries and the Bay. The technical and economic feasibility of such a plan is being investigated.

CHAIRMAN STEIN: Thank you, Dr. Wilbar. Are there any comments or questions?

MR. POSTON: I have a few questions for Dr. Wilbar. I wonder whether the State of Pennsylvania--I understand they classify streams in Pennsylvania, do you also classify that portion of Lake Erie that is Pennsylvania waters?

DR. WILBAR: Yes.

MR. POSTON: And how do you classify that? In what way? What classification do you give Lake Erie waters?

DR. WILBAR: I can't tell you. Mr. Boardman, what is the classification of Lake Erie at present?

MR. BOARDMAN: It is classified for complete treatment.

DR. WILBAR: We have complete treatment, as I pointed out, on Lake Erie and its tributaries in Pennsylvania.

MR. POSTON: I notice that you are going to discharge sewage to the Bay and some of the storm water overflows--discharge those direct to the Lake. Would this then meet your classification of complete treatment?

DR. WILBAR: Well, as you well know, this is a matter of having storm sewers and sanitary sewers together as found in most of the old cities of the United States and the solution here is a very difficult one. To dig up the streets and separate them is a very expensive thing in a large, old city.

The complete treatment of a sewage plant itself, except in cases of major storms where you have a big run of water and the overflow from the drains is--the storm overflow washes out then in these combined sewers over where we are and some of the untreated sewage just can't be helped, I think, except by a very expensive process. As I told you, it would cost about $20 million for the City of Erie to do this. It gets down to a considerable economic problem. It should be done, I say, in Erie and in many other cities in the United States--most of them.

MR. POSTON: The extension of the sewer--to discharge into the Lake, rather than into the Bay and harbor--there would be a means of eliminating a private industry pollution source in the present discharge area, and move it out into the Lake so the Lake could handle it --

DR. WILBAR: There's a greater dilution factor --

MR. POSTON: I wonder whether the Hammermill Paper Company which is putting in wells would have a capacity there to handle breakdowns. I understand that some of the wells--I don't know if they are made specifically for paper mill wastes or not, but they have these underground discharges to dispose of the waste. I have heard that in some cases this practice has to be stopped until further wells can be drilled or until some other means of disposal can be found. I wonder whether extra capacity will be available, so that in the event of breakdowns they will be able to handle this? Or would that mean that it would go back into the Lake, then, for a period of time?

DR. WILBAR: The engineers have estimated that the two wells should be able to handle the situation from some experience elsewhere. Now this is not a widely used practice and we can't be absolutely sure about it.

MR. POSTON: In Erie, your Public Health Service report has said that there is a load of some 4,000 tons of phosphate per day to Lake Erie from Erie and other local sources in that area. Does the Sanitary Water Board and the Health Department disagree with this evaluation?

DR. WILBAR: Not that I know of. We have no quarrel with this estimate.

MR. POSTON: Do you think that eutrophication in the Lake is an interstate problem? What is your reaction to this? Do you think eutrophication is an interstate problem?

DR. WILBAR: Yes, I think that it's an interstate and an international problem. Actually the total of the phosphates going into the Lake tend to decrease the volume of the

Lake all the time, and if it decreases on the one shore, it decreases it all over, as far as that's concerned. But I think that the record of the Public Health Service has really not proven that the pollutants from the State of Pennsylvania and perhaps the State of New York actually get into the water supply of, or the use of, another State.

MR. POSTON: What you're saying is that all the contributions make the whole problem as far as eutrophication, isn't that right? I think that's all I have now, Mr. Chairman.

CHAIRMAN STEIN: Any further questions or comments?

Doctor, did you want all your tables at the end included in the record?

DR. WILBAR: Yes, that's right.

CHAIRMAN STEIN: That will be done without objection.

Doctor, I heard you speak about the Public Health Service Report, about some inaccuracies you believed you found in them, but I wonder if you would like to look at your first page on Sewage Status, page 1, Lake Erie Basin (July 1965). I wonder if you'd look down at about the middle of the page where you have Wattsburg running into Four Mile Creek, where you have Behrend Center flowing into Trout Run as the receiving stream and Harbor Creek running into Trout Run. Would you, in the interests of accuracy, like to change "Four Mile Creek" to the "Ohio Basin," "Trout Run" to "Seven Mile Creek" under Behrend Center, and on Harbor Creek to change "Trout Run" to "Seven Mile Creek"?

DR. WILBAR: I still don't see where we are here.

CHAIRMAN STEIN: On page 1 of the charts.

DR. WILBAR: I believe those corrections are in order.

CHAIRMAN STEIN: I think it is inevitable in all these reports. The people who have been to Cleveland have found these little errors but they don't change the main thrust of the report. The next point I'd like to make is that I listened with interest to your relatively rosy and optimistic report.

The problem that I have, Doctor, is that I guess we've looked at this report and heard it in Cleveland. Let's read the remarks of the Federal investigators where they say Lake Erie and its tributary streams in the Pennsylvania Basin are polluted by discharges of municipal and industrial wastes combined through overflows, accidental spills from vessels and industries and wastes from lake vessels and land drainage. This pollution has caused taste and odor problems in domestic water supply, bacterial contamination of bathing beaches, fish kills and algae growth. In addition, wastes which cause the receiving waters to turn blackish-brown and have a foul odor have interfered with recreation and aesthetic enjoyment. Somehow it seems to me from listening to your account and the Federal investigator's account--I hope you were both looking at the same stream, but it really doesn't seem like it's the same one--I wonder if you'd comment on that?

DR. WILBAR: Well, we're with this all the time.

The other investigation was done rather quickly and superficially. There is, however, of course, a study going on--the Lake Erie Comprehensive Study Group, which I think will give us very careful answers, but this investigation did not come out of that study, which is not completed, is that not correct?

CHAIRMAN STEIN: I understand that, but Doctor, I was up the Buffalo River yesterday, and I did that quite quickly and superficially. Here's what they're talking about: combined sewer overflow, accidental spills, bacterial contamination of bathing beaches, receiving waters of foam turning blackish-brown and having a foul odor which interfered with recreation and aesthetic enjoyment.

I believe that on the basis of a short boat trip up the Buffalo River, or, perhaps, the Cuyahoga River, that I could have made judgments like that without any extended survey. I don't see that these observations are particularly refined. These were a few visual observations. If our people talk in terms of bacterial contamination, they must be dealing with gross counts. I don't know if you need that refined an examination to see the obvious things.

DR. WILBAR: The solution is a relative thing. I think that everybody here knows that. In every stream, every river, every lake in the United States there is some pollution. This is the matter we are trying to get out at this conference--

the exact extent of the pollution, the type of pollution, where it occurs and how it is being met and how further it can be met. We don't need a conference to determine that there is some pollution, but we do differ as to the exactitude of the statements about details of pollution factors.

CHAIRMAN STEIN: Well, if you need a conference to determine that, that's what the law provides. But sometimes we find we need a conference to determine how and when, in particular, the pollution is going to be cleaned up.

I have another one. On page 4 of your statement you say, "The quality of the streams entering Lake Erie from Pennsylvania is generally good." But the next sentence goes on to say "The only exceptions are Cascade Creek, Mill Creek and Garrison Run which receive the combined storm and sanitary sewer discharges above mentioned." As I understand it, Cascade Creek, Mill Creek and Garrison Run are rivers discharging wastes into Lake Erie around Erie, Pennsylvania. I suspect that the other streams might be good. But when you say the only exceptions are your three major streams and your wastes are carried through these from your metropolitan area, it seems to me a pretty big exception,indeed.

DR. WILBAR: As we pointed out, when you have these heavy rains, when you have overflows where the combined discharges from the City of Erie of both storm drains and sewer drains, then you have an amount of pollution at that point.

This happens whenever you have this heavy rain and heavy discharge. The rest of the time it's satisfactory. But this is a problem of this combined type of storm-drain sewer, as it is in every large city in the United States.

CHAIRMAN STEIN: You didn't just say "storm sewer." You said "sanitary sewer discharges," too. Then you say you have no information available to you that indicates pollution of Lake Erie in relation to Pennsylvania as coming from another State. The Federal report does say that "Discharges of municipal and industrial wastes originating in Michigan, Indiana, Ohio, Pennsylvania, and New York are endangering the health or welfare of persons in States other than those in which those discharges originate..."

DR. WILBAR: Just saying it doesn't make it so. I think it has to be proven.

CHAIRMAN STEIN: But we have that information, Doctor. Is our information wrong or do you think we prepared a blank sheet of paper? I think the information was supplied to you. You have the information. If you want to contest the information that's one thing. If you're going to deny receiving the information, that's another.

DR. WILBAR: We received the information, as I said, but you have to take into account the pollutant factors, the currents, the amount of sewage discharged, the amount of pollutants in each area. From the data supplied, we feel that--I don't think it's a very major point, really--but we feel that the report of the Public Health Service has not really proven interstate pollution, as far as New York and Pennsylvania are concerned.

CHAIRMAN STEIN: As far as we're concerned that is the major point--whether there is interstate pollution. Because I think while the Governors of Michigan and Ohio invited us in on the intrastate problem, the Governors of New York and Pennsylvania have not seen fit to do so. The only way we have jurisdiction, if we are going to have any at all, is on an interstate problem.

As I understand your statement before to Mr. Poston, you did indicate that all the pollution from the various sources, particularly the phosphates he was talking about, was contributing to the degradation and eutrophication of the Lake. Am I not correct as far as I understood that? Isn't that interstate pollution?

DR. WILBAR: Well, if it is a matter of definition I think this could be stated. In our opinion if it is the shoreline in the Pennsylvania areas that is being affected by eutrophication, and the bottom too, this, of course, reduces the total size of the Lake, but it doesn't necessarily mean ipso facto that this is pollution as far as the rest of the Lake is concerned. This is a matter of definition. I don't think it is an extremely important point.

CHAIRMAN STEIN: Doctor, I think this is a vital point. I just want to ask one other question, and this is somewhat the same. I believe you said that you have no information that indicates pollution of Lake Erie in relation to Pennsylvania occurring from other States. Then on the next page you say you have no information that indicates that interstate pollution involving Pennsylvania is occurring in Lake Erie. Then, you go on to say "an indication of the eutrophication of the waters of the Lake is observed periodically in the Lake Erie area. Heavy mats of algae are washed ashore creating nuisance conditions and discouraging bathing."

Where does that come from? Does it come from inside Pennsylvania? Does it come from outside Pennsylvania? Are you causing that eutrophication in the Lake and it just affects you in Pennsylvania and doesn't go anywhere else? No one else is contributing to that and causing those nuisance conditions and discouraging bathing? We are in a world by ourselves on the Lake ---?

DR. WILBAR: Mr. Chairman, this area is around the City of Erie and it's caused by Pennsylvania and it's affecting Pennsylvania.

Now, we're interested in the whole Lake. We're members of the International Commission studying the Lake, too. We are all involved, of course, as to what it affects. But I don't think we need a beating over the head to try to prove that this is interstate pollution. I think the main point is that we work together, and not let the Federal Government try to take over and control the situation, because I think as far as our State is concerned, we are well on the way to controlling it. We certainly need cooperative workers. It has been said time and time again. We need researchers and research as to how to get rid of phosphates, in the first place, and to make technical improvements and financial aid in building the costly sites of treatment that are needed in these cases.

CHAIRMAN STEIN: Doctor, this is the point. I agree with you in all the basic philosophy, except when we come to one real particular point. I don't think that the Federal Government or anyone else is trying to prove that there is interstate pollution. I think they are facing the unpleasant fact that there is interstate pollution and it so states in their report. They have charged that Lake Erie is one body of water. There aren't really compartments dealing with Pennsylvania, with New York, Ohio and Michigan. If we are going to deal with the problem of eutrophication of the Lake, you have to deal with the Lake itself. This is not a question of talking about anything but cooperative work and not working with the straight facts. But I think if we are going to come up with two diametrically opposed viewpoints, one, that wherever we find pollution in the Lake, whether it is about Detroit, Toledo, Cleveland, Erie or Buffalo--these are all localized problems that can be neatly handled by the State and local authorities in their own compartments, without bothering anyone else, or two, whether we are dealing with a regional resource problem that calls for a Federal interest. As far as I can see, the Governors of all the States have indicated that there is a Federal interest and from my own point of view, I have been on three of the rivers here within the past few months--the Detroit River, the Cuyahoga and the Buffalo, and if that's the notion of progress being made on a local level in handling the problem, then perhaps the Federal Government is just what is needed in this situation.

I can't believe that you can take a boat trip up this river or the Cuyahoga River and point with pride to the local progress.

DR. WILBAR: The question is that the Federal Government, ipso facto can do a better job than the State Government, and I do not accept that assumption.

CHAIRMAN STEIN: My assumption is that the Federal Government, in cooperation with the State and local governments, can do a better job, and I think that is the premise of the Federal role, Doctor. The point is that I think that meeting after meeting after meeting, when State and local people--not so many local but the industry--have talked in terms of State Government and interstate agencies they have always left out the Federal Government. I don't think this is a question of jurisdiction--of fighting about state's rights. I think the job is so big that we all have to do it. I think the preservation of Lake Erie is a tremendous job, and it's not as compartmentalized as local.

DR. WILBAR: I agree with you, except for your statement that in these meetings the Federal Government is left out. It is not left out at all. I agree that there must be Federal-State cooperation. It's just a matter of what type of cooperation.

CHAIRMAN STEIN: That's right.

DR. WILBAR: And I think that we've been going around in circles. It is not very important, actually, when we all agree that we must work together to try and prove that a given molecule or a given bacterium from Pennsylvania got into a water supply in Ohio.

CHAIRMAN STEIN: I would hope we weren't pushed to those extremes.

Are there any other comments or questions?

MR. OEMING: Dr. Wilbar, do you feel that from the standpoint of Pennsylvania that the interests of Pennsylvania are affected by the discharges from the other States, is this what I interpret your statement to mean? That you don't feel or that you do feel that the discharges are adverse to Pennsylvania--that is, the discharges from other States?

DR. WILBAR: What I have said is that there is no proof in the Public Health Service Report that the discharge from another State is causing the pollution in the waters of Pennsylvania or that the discharge of Pennsylvania into the waters of Lake Erie is causing pollution in another State.

The total implication--the building up of the solid portions which reduces the water in the Lake in any area really affects the whole Lake. The total volume is going down, and there is no question about that. I think we need to work together on this.

CHAIRMAN STEIN: Just a point of information on this. Doctor, are you attributing the water level and the volume going down in the Lake to eutrophication?

DR. WILBAR: To a large degree, to some degree, yes.

CHAIRMAN STEIN: I just wanted to get your view on that.

Are there any further questions or comments?

MR. POSTON: I was going to ask the Doctor if the State proposes to have industries in Pennsylvania be heard here at this conference? Are there any that will be?

DR. WILBAR: We have invited industries if they wished to testify at this conference, and to be heard and none of them have seen fit to do so.

MR. POSTON: How about the cities? Will there be any cities?

DR. WILBAR: This is also true. There is a representative from Erie County and City here, but they said that they did not wish to testify any further than I have testified.

MR. POSTON: Well, perhaps I should ask you then--

DR. WILBAR: I invited them to do so but they chose not to.

MR. POSTON: Will industrial information that pertains to the quantity and the type of wastes from industries in Pennsylvania be available to the Public Health Service?

DR. WILBAR: Yes.

MR. POSTON: This will give us quantity and quality of discharges to the waters?

DR. WILBAR: Our law is unlike the law of some other States. We are permitted to give such information out.

CHAIRMAN STEIN: We have always had the best type of cooperation from Pennsylvania, through the years. I don't think there's any problem here.

Any further comments or questions?

MR. POSTON: I had one other question. Would the State of Pennsylvania participate in any remedial measures and recommendations needed by the conferees at the end of this conference?

DR. WILBAR: I pointed out this morning that I thought the conclusions and recommendations should come after everybody has been heard at the end of the conference, and not part-way through. But then at the end of the conference, we will participate. Mr. Boardman and I have full authority to participate in the conclusions for Pennsylvania.

MR. OEMING: Dr. Wilbar, I don't think I completely understand your answer to my question. Maybe I can put it a little more specifically.

As Health Officer of Pennsylvania, do you know of any injury to the health of the people of Pennsylvania, by reason of the discharge from other States?

DR. WILBAR: I do not.

CHAIRMAN STEIN: Do we have any other comments or questions? If not, thank you very much, Dr. Wilbar, for your very enlightening presentation. (applause)

As you know, this is just our way of getting at a problem and agreeing.

I think the next presentation will be about thirty to forty-five minutes. Let's take a ten minute recess and then we will return.

(WHEREUPON A SHORT RECESS WAS TAKEN.)

CHAIRMAN STEIN: May we reconvene please? I would like to indicate what we hope will be the schedule for the rest of the afternoon. We hope to complete the Federal presentations and New York State will be ready to go on with its presentations and invitees, starting at 9:30 in the morning.

DR. WILBAR: During the recess the City of Erie has asked to have its Chief Engineer, Mr. Moriarty, make a brief statement, and we have concurred. If it is satisfactory with the Chairman, I'd like to ask Mr. Moriarty to make his statement on behalf of the City of Erie.

CHAIRMAN STEIN: Mr. Moriarty?

MR. MORIARTY: I'd like to make a correction. I am Sanitary Engineer at the Erie County Health Department and represent the County of Erie.

I have a few words here written down on paper, so I will read this direct.

Erie County, Pennsylvania is located, as you know, between the States of Ohio and New York. I tend to agree with Dr. Wilbar that most of our obvious pollution problems are local. However, I cannot believe other than that Pennsylvania is receiving residual pollution, as I see it, from the west and is giving the same to New York. By residual, I mean we are not receiving the brunt of the pollution but the effects of it. The growth of algae is one of the residuals. The loss of the commercial fishing fleets out of Erie also reflects residual pollution on Pennsylvania.

Do not think, however, that we do not have our own problems. We have perhaps the best beaches on the south shore of the Lake at Presque Isle State Park and, as a consequence, tourism is a growing industry for Erie County. To protect this industry and the health of the people who associate themselves with this industry by water recreational activities, the City and County of Erie, Pennsylvania, looks to the future to correct pollution problems and protect these facilities (the tourism industry).

Combined sewers of the WPA days are a thing of the past in new construction. The City of Erie has combined sewers, some $16 million to $22 million in new construction at today's going construction costs if they were to be replaced. While I cannot talk for the City of Erie, I am sure that if sufficient monies were available through State and Federal aid one source of our local problem would be solved. The City cannot finance such an undertaking alone.

Industry contributes its share of pollution to the Lake. Even though much money has been spent, industrial waste continues to be a problem. Phenols, color, foam and fiber are some of the by-products of industry. You may say these are not health hazards, but they have aesthetic consequences and very often made ten to twenty miles of shoreline not usable for local people. Surveillance on the part of industry can go a long way towards eliminating these forms of pollution.

Erie has an enviable spot on the Lake--we hope to keep it that way. City-county governments are for pure water--industry must be for it, not only for their investment but for their water needs and the labor market.

In conclusion, I would like to make one additional comment that is not only part of Erie's problem but also Lake Erie's--and any other lakes and rivers throughout this Nation. The detergent industry came up with a new detergent to take away visible pollution in the form of foam.

Just think how much additional good the same industry can do if they would find a substitute for the phosphates that make up part of their detergents. This may be a side line to our problem, but when we look at the algae problem in Lake Erie and in the other lakes around the country, here is an area where one pollution potential can be corrected before the housewife pulls the plug on the kitchen sink.

I asked the Chairman if we would have permission to send a written report to this body in the next week or so. Is this possible?

CHAIRMAN STEIN: Without objection we will keep the record open for a report of that kind.

Are there any comments or questions for Mr. Moriarty? If not, thank you very much for your statement.

(The report referred to by Mr. Moriarty is as follows:)

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ERIE COUNTY DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH

2101 PEACH STREET
ERIE, PENNSYLVANIA

August 12, 1965

Mr. Everett F. Zurn
Zurn Industries, Inc.
2214 West 8th Street
Erie, Pa.

Re: Lake Erie Pollution
State of Pennsylvania

Dear Sir:

In accordance with the desires of Erie County Commissioners, enclosed is a report on Lake Erie Pollution as related to Erie County, Pa.

The data is being submitted to supplement the enclosed statement made by Mr. Moriarty at the Buffalo hearing on Lake Erie pollution. The report and information were assembled by Mr. Moriarty.

If you desire additional copies, please do not hesitate to contact this office.

Very truly yours,

Felix S. Shubert, M.D.
Deputy Director

LRM/tt
Enc.
cc: Erie County Commissioners (3)
Mr. Stein, P.H.S. Washington
Mr. Northington, P.H.S. Cleveland

(See Mr. Moriarty's presentation above)

ERIE COUNTY DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH

REPORT ON LAKE POLLUTION--AUGUST 1965

CONCLUSIONS

1. Local pollution is a problem that the county-city government and industry are involved in.

2. Interstate pollution does exist and the State of Pennsylvania in a mild way causes interstate pollution.

3. By comparison, the State of Pennsylvania far surpasses the nearby states in its pollution abatement program. This is shown by the requirement that all sewage treatment plants on the Lake Erie drainage basin must have complete treatment.

4. By comparison, the State of Pennsylvania, Erie City-County have the best beaches on the lake in the form of Presque Isle State Park, and relatively speaking has a minimal amount of pollution entering Lake Erie.

RECOMMENDATIONS

1. That local governments through state and federal aid plan pollution abatement programs to relieve the bay and Presque Isle Lake area of intermittent sewage pollution.

2. That industry use its knowledge and know-how to cope with the technical problem of industrial waste removal.

3. That industry institute a "house-keeping" and surveillance program on their actual waste disposal processes.

4. That because an interstate pollution problem does exist, cooperation between the states takes place to restore not only Lake Erie but all the Great Lakes to the condition suitable in every respect for man's use.

ERIE COUNTY DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH

REPORT ON LAKE POLLUTION--AUGUST 1965

As part of the Public Health Service hearing with representatives of the states of Indiana, Michigan, New York, Ohio and Pennsylvania in Buffalo, New York on August 10, 1965, Dr. Wilbar, Secretary of the Pennsylvania Sanitary Water Board delivered a prepared statement to the hearing representatives. In his statement, Dr. Wilbar said, "We have no information available to us that indicates that pollution of Lake Erie in relation to Pennsylvania is occurring from another state".... also "We have no information that indicates that interstate pollution involving Pennsylvania is occurring in Lake Erie."

A discussion of the above point followed and as a result, Commissioner W. Hill and Mr. L. Moriarty, a sanitary engineer from Erie County, Pa. asked of and were given permission by Dr. Wilbar to make a statement. (Mr. Moriarty gave essentially or basically the statement that is enclosed. The original statement, taken from notes, has been edited, but the sense and intent of the edited statement does not differ from the original.) The statement is enclosed.

The statement presented by Mr. Moriarty indicates that a local pollution problem does exist and that the state of Pennsylvania is affected by interstate pollution.

LOCAL POLLUTION

On page 108, Part 3 -- "New York and Pennsylvania Sources" Report on Pollution of Lake Erie and its Tributaries, a table indicates coliform and fecal streptococcus contamination on beaches of Presque Isle State Park. The Erie County Department of Health took part in this survey and submits

Reference R-1 as detailed information for resource information to the hearing committee. From these reports, it is quite evident that the beaches are contaminated from a local source when the wind is in the right direction.

The stream sample reports (R-2) of 1964-65 also indicates that pollution is entering Lake Erie in varying degrees from Pennsylvania tributaries. Here again is confirmation that a local pollution problem exists.

The beach survey report (R-3) of this summer (1965) further indicates that local pollution is a factor in Erie County and the State of Pennsylvania.

It should be understood that coliform counts should not be used as the sole criteria of pollution. Chemical and visual evaluation should also be part of the final decision. As Erie County Health Department does not have a laboratory for chemical analysis, it has visually observed unsatisfactory conditions that do verify the coliform counts.

INTERSTATE POLLUTION

Again, the County Health Department cannot verify interstate pollution by means of chemical analysis but does indicate that by visual and pictorial means, interstate pollution does exist. (The pictures in form of slides are on file.) Interstate pollution is evident by:

1. Algae Cladophora collects on the entire length of the Pennsylvania shore line. The growth of this plant at the

Ohio line, with the prevailing currents to the east, cannot be attributed to the waste of Pennsylvania alone. The nutrients must come from other areas of the lake.

2. The decline of the commercial fishing fleet in Pennsylvania has been attributed to the lack of fish in Lake Erie. It is also the contention that the declining fish catches over the years has been brought about by pollutants in the lake. This pollution is not entirely from Pennslyvania but affects the fish industry in Pennsylvania and thereby becomes an interstate problem.

3. Waste from Erie industries contaminate Lake Erie shore line to the east and as recently as August 3 and 5, 1965, brown-black color has been observed in the lake within a half mile of the New York state line. It is the contention of the Erie County Department of Health that industrial waste does periodically get into the State of New York waters.

REFERENCE

R-4. Also enclosed for resource information is an article presented to the Erie County Commissioners in February 1964 relative to Lake Erie pollution.

R-5. Copy of a letter to the Erie County Commissioners, dated May 14, 1964, from Mr. J. Harvey on Lake Erie pollution. (Resource information in Mr. Zurn's letter only.)

R-1A. ERIE COUNTY DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH

PRESQUE ISLE STATE PARK -- BEACH SURVEY
June 6 to June 21, 1964 -- SUMMARY

TO: Dr. Felix S. Shubert
Deputy County Health Director

FROM: Lawrence R. Moriarty
Director, Division of Environmental Health

Attached for use now and future reference are the following:

1. Coliform Index for waters of the Great Lakes.
2. Standards for Natural Swimming Places.
3. Summary of Presque Isle Beach Survey June 6 to June 21, 1964, inclusive.

Samples from beaches 1, 8, 10 and 11 are collected by Presque Isle State Park life guards, are given to Erie County sanitarians and delivered to the laboratory in the matter of two hours. Appropriate dilutions are made in the laboratory so that each sample will give a representative result. Tests are made for coliform and fecal streptococcus bacteria. Item #3 is the result of 17 days of sampling.

Coliform. Item #1 indicates that Beach #11 at times was not satisfactory for swimming. Item #2, paragraphs 1 and 2 also indicate that Beach #11 is not satisfactory for swimming.

Fecal Streptococcus. While standards have not been promulgated to indicate what levels of fecal streptococcus bacteria are detrimental, the presence of fecal streptococcus bacteria may be taken as an indicator of relatively fresh pollution. This then, in general, would indicate the possibility of Beach #1 periodically being contaminated with minor amounts of fresh pollution.

Wind Direction. Although wind direction is shown on Item #3, no correlation is being made as to the relationship of pollution and wind direction on Beach #11. It is felt that there is a connection, however, but more study and evaluation needs to be done to get a general concept as to what is happening.

General. To date, samples have been collected for 17 continuous days and 136 samples processed through the laboratory. Inclusive of June 14, 1964, the water sample laboratory cost was $200.

Comments. 1. To date, the results indicate Beach #11 is a questionable area in which to swim and that Beach #11 is periodically affected by waste coming from the west.

2. I believe a meeting of yourself, Mr. Wargo and myself should be arranged to work out a plan for discriminate use of Beach #11. You might wish to call the State Health Department and the Public Health Service into the meeting.

3. I would suggest that if this information is given to the press, that it be given with due explanation so they will not indicate the whole area is polluted.

INTERPRETATION OF COLIFORM INDEX AS FOUND IN NATURAL WATERS OF THE GREAT LAKES AND UPPER MISSISSIPPI RIVER DRAINAGE AREA

COLIFORM PER 100 ml.		INTERPRETATION
	0	Water Sample free of pollution
Not more than	1	Treasury Department standard for drinking water
	10 to 100	Indicative of good water -- normal for inland lakes and Great Lakes which are free of sewage pollution
	100 to 500	Normal for inland streams, free of detrimental sewage pollution, might be attributed to land wash
(Not satisfactory for swimming)	1,000	Suspicious -- generally indicates mild pollution in natural waters, but dangerous in proximity to fresh sewage pollution
"	10,000	Definite evidence of fresh sewage pollution -- menace to health.
"	100,000	Heavy sewage pollution -- definitely dangerous
"	1,000,000	Normal sewage

The above standards were agreed upon for interstate use by the Great Lakes and Upper Mississippi River Drainage Basin Board of Engineers. Reference can be found in "Coastline Pollution Surveys of Michigan, June, 1933" Report of Michigan Stream Control Commission.

ERIE COUNTY DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH

NATURAL SWIMMING PLACES

The water in natural or semi-artificial swimming beaches shall be deemed to be contaminated if:

1. In a series of at least ten (10) samples collected by the Department over a period of at least thirty (30) days but not more than one year from a beach, more than fifty (50) percent of the samples show a most probable number of coliform organisms of more than one thousand (1000) per 100 milliliters, or
2. More than twenty (20) percent of a series of such samples shows a most probable number of coliform organisms of more than twenty-four hundred (2400) per 100 milliliters, or
3. More than five (5) percent of a series of such samples shows a most probable number of coliform organisms of more than four thousand (4000) per 100 milliliters.

No swimming beach shall be so located to permit it to be adversely affected by the discharge of sewage or industrial waste; nor shall it be so located that by its use it will adversely affect the source of supply of a public water supply system.

(Extract from proposed "Minimum Design Standard for Public Swimming Places," Pennsylvania State Department of Health.)

ERIE COUNTY DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH

PRESQUE ISLE STATE PARK -- BEACH SURVEY

June 6 to June 21, 1964 -- SUMMARY

SAMPLE NO.	DATE	DAY	COLIFORM No. per 100 ml					FECAL STREPTOCCUS No. per 100 ml				WIND DIRECTION
			BEACH					BEACH				
			1	8	10	11		1	8	10	11	
1	6/5	F	120	24	60	350		2	1	1	36	S to NE
2	6/6	S	230	440	460	4000		8	2	3	31	SW to SE
3	6/7	S	360	830	156	5400		133	<1	<1	1	S to SW
4	6/8	M	430	30	260	1400		<1	29	29	5	N to S
5	6/9	T	870	640	480	700		2	1	2	6	S to SW
6	6/10	W	480	86	170	7300		75	21	8	3	W
7	6/11	T	260	96	100	320		1	<1	<1	2	NE
8	6/12	F	50	20	24	400		1	2	13	5	N to S
9	6/13	S	26	22	26	230		11	8	17	3	S to W
10	6/14	S	12	22	20	144		68	14	26	2	W
11	6/15	M	1100	320	78	260		200	98	31	3	NE to SW
12	6/16	T	30	98	16	4300		1	5	36	240	0
13	6/17	W	40	14	60	3800		3	3	4	3	SE to NW
14	6/18	T	6	4	4	5		4	3	<1	3	E to SW
15	6/19	F	36	10	4	100		<1	<1	1	6	SW
16	6/20	S	120	17	16	2200		66	11	3	<1	S to W
17	6/21	S	28	18	11	2400		26	32	2	8	E to W

R-1B ERIE COUNTY DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH

PRESQUE ISLE STATE PARK -- BEACH SURVEY

June 22, 1964 to July 12, 1964

REPORT II

TO: Dr. Felix S. Shubert
Deputy County Health Director

FROM: Lawrence R. Moriarty
Director, Division of Environmental Health

Attached you will find a summary of the Presque Isle Beach Survey for the period of June 22 to July 12, 1964, inclusive. The results, except as stated below, have been quite satisfactory.

On Wednesday, July 1, 1964, you, Mr. Michael Wargo, Park Superintendent, and myself met to determine a course of action to be taken and under what circumstances any of the park beaches should be closed.

To summarize the meeting, it was agreed by all if any two consecutive daily coliform samples from any of the four beaches were over 1000 per 100 ml of sample, the beach in question would be closed. The beach would remain closed until another good sample was obtained and would again be closed if two more consecutive samples were obtained.

This procedure is reasonable in that, in comparison with the lactose or MPN reporting method, 48 hours or more would lapse before sample results would indicate high counts. Two consecutive samples within approximately 36 hours by the filter method gives a double check and an indication of a prolonged period of possible high counts.

By this method and using the results to date, Beach #11 might have been closed on June 8 and 9, June 18, 22 and June 28 and 29. As of the 12th of July, the reporting method inaugurated on July 1, 1964, does not indicate any of the beaches should be closed.

Daily samples will continue to be collected from Beaches #1, Water Works, #10 and #11. To date, 38 daily trips have been made to the State Park. One hundred and fifty-two (152) samples have been collected with three hundred and three (303) samples being analyzed in the laboratory.

To date, the program has cost the department the following:

Lab. fees --- $757.50
Mileage --- 76.00

Total --- $833.50

The above does not include one man's time (1 1/2 hours) per day.

Tentative plans are now underway with the Public Health Service to do a second two-day intensive survey of the same beaches on August 2 and 3, 1964.

ERIE COUNTY DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH

PRESQUE ISLE STATE PARK -- BEACH SURVEY

June 22 to July 12, 1964 -- SUMMARY

SAMPLE NO.	DATE	DAY	COLIFORM No. per 100 ml				FECAL STREPTOCOCCUS No. per 100 ml				WIND DIRECTION
			BEACH				BEACH				
			1	8	10	11	1	8	10	11	
18	6/22	M	8	3	4	50	18	12	1	8	
19	6/23	T	BB*	<1	<1	900	BB*	18	11	10	
20	6/24	W	420	6	10	3800	1040	320	350	9	
21	6/25	T	66	20	11	780	56	31	42	38	
22	6/26	F	70	30	7	1800	176	32	4	19	
23	6/27	S	90	56	36	5300	128	54	25	35	
24	6/28	S	16	2	10	2700	37	5	9	100	
25	6/29	M	130	70	14	120	54	30	9	62	
26	6/30	T	60	60	15	580	15	9	7	80	
27	7/ 1	W	72	88	20	520	33	52	11	46	
28	7/ 2	T	86	16	6	1200	15	6	3	16	
29	7/ 3	F	100	28	18	600	32	12	3	14	
30	7/ 4	S	56	8	22	90	33	23	38	19	
31	7/ 5	S	30	<2	2	100	9	27	2	4	
32	7/ 6	M	16	4	44	160	166	1	2	16	
33	7/ 7	T	10	14	8	116	7	7	45	7	
34	7/ 8	W	30	<2	34	300	2	7	11	15	
35	7/ 9	T	6	56	14	1300	22	4	4	4	
36	7/10	F	16	32	500	850	27	32	<1	5	
37	7/11	S	70	50	54	9600	13	14	9	2	
38	7/12	S	36	680	970	1700	33	24	40	62	

BB* -- Broken Bottle

R-1C

ERIE COUNTY DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH

PRESQUE ISLE STATE PARK -- BEACH SURVEY

July 13, 1964 to August 1, 1964

REPORT III

To: Dr. Felix S. Shubert
Deputy County Health Officer

From: Lawrence R. Moriarty, Director
Division of Environmental Health

Enc.: 1. Map Presque Isle State Park showing location of bathing beaches samples.
2. Table III, showing results of survey, July 13 to August 1, 1964, inclusive.

The enclosed map shows the location of Beaches #1, #8 (Water Works), #10 and #11. To review -- a daily sample is taken from each of the four beaches about 3:00 P.M. in the afternoon. The sample is taken by a Presque Isle State Park life guard from mid-beach, in neck deep water, waist high. (The guards are to be complimented for their efforts, regardless of weather, to get the samples and return them for pick-up by the Health Department sanitarian.)

As a result of the survey, beach #11 was closed to swimming on July 13 and 30. The other beaches remained in excellent condition during that period.

An intensive survey, similar to the weekend survey of May 28-29, was conducted August 2 and 3 by the Public Health Service. (Complete analysis is not available as of this date -- a report will follow.) This survey replaced the local daily survey of four samples with approximately 70 samples per day.

On July 30, 1964, a dye test was run on the Erie City Sewage Plant outfall. The results were inconclusive. Additional tests will be made along with float studies to determine direction of current and location of outfall.

To date, 58 daily trips have been made to the State Park by the sanitarians, 232 samples have been collected and 460 determinations have been made in the laboratory. The program has cost the Health Department the following:

Laboratory Fees	$1155.00
Mileage	116.00
Total	$1271.00

The survey will continue until the Labor Day weekend. At that time, the Public Health Service will again conduct a two day intensive survey of the beaches.

The above report and enclosed table again points out that beaches, except for beach #11, at Presque Isle State Park are quite satisfactory for swimming; that beach #11, when churned up by storm and wind action, becomes contaminated and is not suitable for swimming for a period of several days.

ERIE COUNTY DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH

PRESQUE ISLE STATE PARK -- BEACH SURVEY

TABLE III

July 13 to August 1, 1964 -- SUMMARY

SAMPLE NO.	DATE	DAY	COLIFORM No. per 100 ml				FECAL STREPTOCOCCUS No. per 100 ml				WIND DIRECTION
			BEACH				BEACH				
			1	8	10	11	1	8	10	11	
39	7/13	M	400	110	84	500	58	11	7	1	NW-NW
40	7/14	T	100	52	64	530	116	39	9	5	S S-SW
41	7/15	W	80	64	32	980	52	9	18	3	W W-Calm
42	7/16	T	4	10	4	700	7	5	2	2	E E-Calm
43	7/17	F	18	2	80	50	25	9	3	6	W W
44	7/18	S	<2	14	2	2700	7	15	<1	5	W S-SW
45	7/19	S	6	8	6	60	28	5	4	25	SW SW
46	7/20	M	<2	< 2	18	80	<1	3	1	<1	NW Calm
47	7/21	T	30	14	130	280	3	2	4	6	SW SW
48	7/22	W	10	26	60	350	1	1	15	6	S S
49	7/23	T	20	24	16	280	10	5	<1	2	NE E-NE
50	7/24	F	6	30	24	180	2	6	17	4	SW SW
51	7/25	S	8	10	12	28,000	6	7	14	64	NE SE
52	7/26	S	6	4	2	410	5	1	23	17	W SW
53	7/27	M	4	24	14	110	1	22	1	14	NW S
54	7/28	T	20	24	22	1400	6	7	2	3	SW S-SW
55	7/29	W	2100	56	90	2000	84	10	13	30	W W
56	7/30	T	4	4	14	30	2	6	2	1	NE N
57	7/31	F	2	6	<2	3500	2	1	<1	3	NE E
58	8/ 1	S	10	<2	28	7600	<1	18	<1	2	Calm E

R-1D ERIE COUNTY DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH

PRESQUE ISLE STATE PARK -- DAILY BEACH SURVEY

August 2 to August 25, 1964

REPORT IV

TO: Dr. Felix S. Shubert
Deputy County Health Officer

FROM: Lawrence R. Moriarty, Director
Division of Environmental Health

ENCLOSED: Table showing results of survey, August 2 to 25, 1964, inclusive.

Daily surveying of the Beaches #1-2, #8 (Waterworks), #10 and #11 continued through this twenty-four (24) day period. The Presque Isle State Park Life Guards collected the samples and the Erie County Sanitarians delivered same to the laboratory that afternoon.

Sample results for August 2 and 3 are average results taken from the data secured on the intensive survey (II).

As a result of the daily survey and in agreement with Mr. Michael Wargo, the Park Superintendent, only Beach #11 was closed, in accordance with the agreement of July 1, 1964, on the following dates -- August 2, 3, 4, 5, 13, 14, 15, 22 and 23, 1964. The agreement was that if on two consecutive days the coliform count would rise over the 1000 bacteria count per hundred (100) milliters, the beach would be closed until a daily sample of less than 1000 count was obtained.

All total, during this period, 45.8% of the samples collected at Beach #11 were above the 1000 count. Of all daily samples collected since the survey began, 37.8% of the samples at Beach #11 have been above the 1000 count. Under the Natural Swimming Place Standards given in Daily Survey I, Beach #11 could have been closed for the twenty-four (24) day sampling cycle. The plan in use by agreement is much more realistic and allows the beach to be used through the cycles of good water.

On August 6, 1964, another dye test of the City of Erie's sewage plant outfall sewer was conducted and again the dye was not noticeable. Either more dye or a different dye will be used to study the flow pattern from the sewer outfall and its effect on Presque Isle beaches.

To date, 82 daily trips have been made to the State Park by the sanitarians, 328 samples have been collected and 654 determinations have been made in the laboratory. The program has cost the County Health Department the following:

Laboratory Fees	$1595.00
Mileage	164.00
Total	$1759.00

One more report on the fifth and final phase of the daily sampling will follow.

CONCLUSION:

Beaches #1-2, #8, #10 continue to be satisfactory for swimming while Beach #11 continues to maintain counts over 1000 for approximately 40% of the time.

The procedure initiated to keep Beach #11 closed under circumstances of high counts has worked out satisfactorily. However, Report V should give final acceptance or disuse of this procedure for the 1965 swimming season.

ERIE COUNTY DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH

PRESQUE ISLE STATE PARK -- BEACH SURVEY

TABLE IV

August 2 to August 25, 1964

SAMPLE NO.	DATE	DAY	COLIFORM No. per 100 ml				FECAL STREPTOCOCCUS No. per 100 ml				WIND DIRECTION
			BEACH				BEACH				
			1	8	10	11	1	8	10	11	
59	8/ 2	S	540	23	434	4440	168	356	260	1179	S S
60	8/ 3	M	933	74	389	4811	345	99	207	752	E S-SE
61	8/ 4	T	14	10	16	12000	2	<1	<1	480	N N
62	8/ 5	W	< 2	1200	44	30	1	88	2	23	NE NE
63	8/ 6	T	< 2	2	120	420	4	4	8	5	N E
64	8/ 7	F	6	8	16	900	6	2	<1	10	SW S
65	8/ 8	S	22	34	22	240	13	21	39	24	WNW N
66	8/ 9	S	4	8	< 2	50	4	8	<1	2	W W
67	8/10	M	< 2	< 2	10	80	10	<1	<1	<1	NE ENE
68	8/11	T	100	10	< 2	2800	<1	<1	<1	< 1	SW SW
69	8/12	W	< 2	< 2	10	9100	300	150	95	45	NW NW
70	8/13	T	30	40	20	2200	160	12	20	4	NW NW
71	8/14	F	120	70	60	2900	48	4	2	48	W NWSW
72	8/15	S	14	14	4	320	11	10	5	4	WNW SW
73	8/16	S	14	8	8	620	<1	<1	< 1	< 1	Calm S
74	8/17	M	30	10	< 2	330	12	5	8	<1	SW S-SN
75	8/18	T	10	10	8	180	10	20	3	< 1	NW NENW
76	8/19	W	4	130	24	80	1	2	< 1	< 1	WNW N
77	8/20	T	450	60	110	7400	220	27	24	8	SW S-SW
78	8/21	F	12	50	860	2800	6	6	3	2	SE SE
79	8/22	S	440	48	26	2900	96	8	4	3	S S-SW
80	8/23	S	58	38	52	760	68	17	19	10	W SW
81	8/24	M	56	6	2	640	8	7	2	4	WNW W
82	8/25	T	130	24	26	16000	10	4	4	5	SW S-SW

R-1E ERIE COUNTY DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH

PRESQUE ISLE STATE PARK -- DAILY BEACH SURVEY

August 26 to September 7, 1964

REPORT V

TO: Dr. Felix S. Shubert
Deputy County Health Officer

FROM: Lawrence R. Moriarty, Director
Division of Environmental Health

Attached is the final tabulation of data from the daily beach survey of Presque Isle Beaches #1-2, #8 (Waterworks), #10 and #11 for the period of August 26 to September 7, 1964.

Like the previous data submitted on these beaches, this information again points out that Beaches #1-2, #8 and #10 are excellent for swimming. However, Beach #11 still remains questionable as an area suitable for daily or unlimited swimming.

Thirty-eight and four tenths (38.4%) of Beach #11 samples were above an allowable count of 1000 bacteria per 100 ml with an average count of 3122 and a median count of 700. At the conclusion of the survey, 95 trips had been made to the state park with 380 samples collected and some 758 determinations and 1400 dilutions made.

To date, the program cost the County Health Department:

Laboratory Fees	$1855.00
Mileage	190.00
Total	$2045.00

A vote of thanks should be given the life guards at Presque Isle State Park for their diligence in taking daily samples. They did not fail to pick up samples by 4 P.M. regardless of the weather.

To summarize the total data for 95 days of sampling, the following information is given:

	TOTAL COLIFORM PER 100 ml				FECAL STREP per 100 ml			
	BEACHES				BEACHES			
	1-2	8	10	11	1-2	8	10	11
AVERAGE	118	64	91	2400	42	20	17	40
MEDIAN	28	18	24	700	10	7	4	5
% SAMPLES ABOVE 1000	2.1	1.1	0	38.9	0	0	0	0

For all samples collected and examined for coliform, 10.6% were above the 1000 count. The average coliform count was 643. The average fecal strep count was 30/100 ml.

In general, Beach #8 could be considered to be the best with #10, #1-2 and #11 following in that order. No conclusions are being presented at this time as a final report to include findings in the daily beach survey, the intensive beach survey and the Presque Isle bay survey will be prepared for you and the commissioners. The results of these three survey programs all dove-tail together, conclusions for one are pertinent to the other.

ERIE COUNTY DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH

PRESQUE ISLE STATE PARK -- BEACH SURVEY

TABLE V

August 26 to September 7, 1964

SAMPLE NO	DATE	DAY	COLIFORM No. per 100 ml				FECAL STREPTOCOCCUS No. per 100 ml				WIND DIRECTION
			BEACH				BEACH				
			1	8	10	11	1	8	10	11	
83	8/26	W	28	14	10	3300	4	4	2	1	SW SW-N
84	8/27	T	10	18	680	13000	2	<1	2	<1	NE SSE
85	8/28	F	6	<2	350	14000	2	2	<1	420	S S-SE
86	8/29	S	<2	4	30	1700	14	6	6	6	E SW-SE
87	8/30	S	8	6	24	560	4	<1	1	2	Calm
88	8/31	M	28	28	28	440	21	5	1	<1	WNW W
89	9/ 1	T	28	26	250	4800	19	8	8	14	NE NESE
90	9/ 2	W	10	16	18	280	2	<1	2	5	NE SENE
91	9/ 3	T	70	12	32	150	3	18	7	<1	NW S-SW
92	9/ 4	F	18	6	8	620	20	3	1	<1	W W-SW
93	9/ 5	S	36	40	120	780	88	34	35	4	SW-NW
94	9/ 6	S	16	12	32	170	1	15	3	7	E S
95	9/ 7	M	4	4	8	700	1	3	<1	2	NE NE

R-1F ERIE COUNTY DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH

SUMMARY -- INTENSIVE SURVEY

PRESQUE ISLE STATE PARK

May 28 and May 29th, 1964

TO: Dr. Felix S. Shubert
Deputy Health Officer

At the request of the P.H.S. and working with them, an intensive survey of Beaches 1-2, 8, 10 and 11 was conducted on May 28 and 29th, 1964. The survey consisted of sampling twice daily each of the above-mentioned beaches and then culturing each sample into two or three dilutions for total coliform and fecal streptococcus determination.

Some one hundred and eighteen (118) samples all total were collected, with four hundred and seventy eight (478) dilutions being set up. These samples were collected in water from a mid-depth when the water was four (4) to five (5) feet deep. This requirement necessitated collecting samples at varying distances from the shore.

The intensive survey is to be run for comparative purposes and to establish a base line for future evaluation of beach conditions. Similar surveys are to be run in the first weeks of August and September.

As the attached table of information indicates, all four beaches at the time of the survey were satisfactory for bathing conditions. A summation of the analysis for each beach would show the following counts per 100 ml of sample:

Beach	Total Coliform	Fecal Strep.
1-2	35	11
8	15	5
10	40	4
11	90	7
Average	45	7

The above information indicates clearly that on May 28 and 29, 1964, the beaches at the Peninsula were in excellent condition and quite satisfactory for swimming. The August and September samplings will show the trend due to temperature, bathing load, recreational facilities and other relative factors.

This survey was conducted by and under the supervision of the P.H.S. at no expense to the county. However, time and service were factors and the following deserve thanks for their efforts:

(cont. on following Page)

ERIE COUNTY DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH

PRESQUE ISLE STATE PARK BEACHES

INTENSIVE SURVEY I -- May 28 and May 29, 1964

DATE	DAY	TIME	BEACH NO.	AVERAGE COUNTS /100 ml		TIME	AVERAGE COUNTS /100 ml	
				Total Coliform	Fecal Strep.		Total Coliform	Fecal Strep.
5/28	Thurs.	A.M.	1-2	60	17	P.M.	30	16
			8	35	11		15	9
			10	125	5		20	6
			11	180	7		135	7
5/29	Fri.	A.M.	1-2	25	10	P.M.	30	2
			8	5	1		10	1
			10	2	2		10	2
			11	25	11		10	2

Public Health Service -- men and materials.
Erie Water Works -- use of laboratory facilities
State Department of Health -- man to work in laboratory
State Department of Forests and Waters -- man and boat
Erie County Department -- men to collect samples and work in the laboratory.

Submitted by: Lawrence R. Moriarty, Director
Division of Environmental Health
Erie County Department of Health

R-1G

ERIE COUNTY DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH

SUMMARY -- INTENSIVE SURVEY II

PRESQUE ISLE STATE PARK BEACHES

August 2 and 3, 1964

TO: Dr. Felix S. Shubert
Deputy Health Officer

As part of the Public Health Service program of sampling the beaches at Presque Isle State Park, this is the second in a series of three surveys in which each of the four previously sampled beaches (#1-2, #8 (Waterworks), #10 and #11) were intensively sampled.

Samples were collected twice daily from approximately eight stations on each beach. To repeat the procedure--each sample was checked for coliform and fecal streptococcus. At least two dilutions were run on each sample.

Some one hundred and twenty-eight (128) total samples were collected, with three hundred and twenty-four (324) dilutions being set up. These samples were collected in water from a mid-depth when the water was four (4) to five (5) feet deep. This requirement necessitated collecting samples at varying distances from the shore.

The table below indicates a comparison of the May and August surveys:

TABLE I

BEACH	Count/100 ml Total Coliform MAY	Count/100 ml Total Coliform AUGUST	Count/100 ml Fecal Strep. MAY	Count/100 ml Fecal Strep. AUGUST
1-2	35	736	11	257
8	15	49	5	225
10	40	254	4	234
11	90	4625	7	965
SURVEY AVERAGE	45	1416	7	420

If the counts were looked at from the point of the median sample, the results would be as follows:

TABLE II

BEACH	Count/100 ml Total Coliform MAY	Count/100 ml Total Coliform AUGUST	Count/100 ml Fecal Strep. MAY	Count/100 ml Fecal Strep. AUGUST
1-2	30	50	4	76
8	12	30	1	101
10	10	115	2	79
11	60	3900	2	470

A comparison of the average with the median indicates the following:

Coliform -- May - August

Only on Beach #11 is the median count of 60 - 3900 above the average count of 45 - 1416. This means that for August, even though the beach samples show that the average count is close to being satisfactory at a 1000 per 100 ml count, the median count indicates most of the samples were well above 1000 and Beach #11 was unsatisfactory for swimming at that time.

It should be pointed out that the August 2 and 3 survey was run under very difficult conditions. Stormy conditions with heavy rains and rough water dominated the entire period of survey. The survey shows the effect of bad weather conditions and the results this condition would give at the beaches. The State Park Life Guards are to be given the writer's, sanitarians' and P.H.S. thanks for participating in this survey for, without them, it is doubtful that samples would have been collected on these two days.

Comparison of the average with the median on the other beaches indicated that only a few samples were high and the beaches #1-2, #8 and #10 remained satisfactory for swimming.

A comparison of the May results with the August results and knowing the stormy conditions shows the results of such "riling up" of the water. This is quite noticeable in the average counts.

CONCLUSIONS:

1. Storms do affect bacterial counts on the beaches by intensifying same.

2. Beach #11 is affected by outside contamination and, as the results show, should be closed when storm and weather conditions cause the bacteria counts to go up.

3. Table III indicates that weather also can and is a factor of raising the counts above allowable levels on Beach #1-2. Continued efforts should be made to stop pollution from entering the lake west of the State Park.

CREDITS DUE:

Presque Isle State Park Life Guards for collecting samples.

State Health Department for supplying two men to work in the laboratory.

City of Erie -- supplying Water Works Laboratory.

Erie County Department of Health -- Sanitarians working with the Life Guards and in the laboratory.

Public Health Service for supplying two men, equipment and media for test.

Submitted by:
Lawrence R. Moriarty, Director
Div. of Environmental Health
Erie County Dept. of Health

ERIE COUNTY DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH

PRESQUE ISLE STATE PARK BEACHES

INTENSIVE SURVEY II -- August 2 and 3, 1964

DATE	DAY	TIME	BEACH NO.	Average Counts/100 ml TOTAL COLIFORM	Average Counts/100 ml FECAL STREP	TIME	Average Counts/100 ml TOTAL COLIFORM	Average Counts/100 ml FECAL STREP
8/2	Sun.	A.M.	1-2	183	62	P.M.	894	274
			8	26	124		20	589
			10	171	412		69	109
			11	3520	1212		5356	1146
8/3	Mon.	A.M.	1-2	1368	313	P.M.	498	377
			8	20	10		128	188
			10	474	219		303	196
			11	5322	980		4300	523

R-1H ERIE COUNTY DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH

SUMMARY -- INTENSIVE SURVEY III

PRESQUE ISLE STATE PARK BEACHES

September 14 and 15, 1964

TO: Dr. Felix S. Shubert
Deputy Health Officer

FROM: Lawrence R. Moriarty
Division Director

The final phase of a three-part program by the Public Health Service and the Erie County Health Department to do extensive concentrated sampling of Beaches #1-2, #8 (Waterworks), #10 and #11 of Presque Isle State Park was completed on September 15, 1964.

As in the two previous surveys, samples were taken in water from mid-depth when the water was four (4) to five (5) feet deep. Four to six samples were collected from each beach twice daily.

Seventy-six (76) samples were collected, with three hundred and ninety-four (394) dilutions being set up. Both total coliform and fecal streptococcus determinations were made.

Table I below indicates a comparison of the May, August and September surveys.

TABLE I

BEACH	Count per 100 ml Total Coliform MAY	AUGUST	SEPT.	Fecal Strep. MAY	AUGUST	SEPT.
1-2	35	736	4	11	257	27
8	15	49	140	5	225	11
10	40	254	166	4	234	10
11	90	4625	3822	7	965	15
Survey Average	45	1416	1033	7	420	16

Table II below indicates a comparison of the median samples collected during the same periods.

TABLE II

BEACH	Count per 100 ml Total Coliform MAY	AUGUST	SEPT.	Fecal Strep. MAY	AUGUST	SEPT.
1-2	30	50	2	4	76	2
8	12	30	10	1	101	6
10	10	115	33	2	79	3
11	60	3900	3150	2	490	10

The September survey again points out that Beach #11 is periodically contaminated by pollution from unidentified specific sources. Sixty-five percent (65%) of the samples collected at Beach #11 during the two-day survey were over the allowable 1000 coliform count per 100 ml.

Brown-colored industrial waste was very noticeable on Beach #11 on the morning of September 14 and on beaches #8 and #11 on the morning of September 15, 1964.

The presence of the waste is definitely related to the wind direction. The wind for the 14th and 15th was from the south, south-east and east, driving the waste to Beach #11 then around the eastern extreme of the Presque Isle beaches in a loop which dipped back into Beach #8. This color was verified by tests taken of water coming in through the Chestnut Street Water Works intake on September 15, 1964.

High median and average samples for the August survey again point out the storms do affect bacterial counts on all beaches. The increase can be attributed to riling-up of the surrounding waters and increased run-off.

The counts on Beaches #1-2, #8 and #10 based on this survey were exceptionally low, continuing to point out that Presque Isle State Park has exceptionally good quality water for swimming and bathing purposes.

CONCLUSIONS:

1. Wind direction can be a factor in:

A. elevation of bacterial counts on Beach #11.

B. industrial waste causing a definite coloring of Beach #11.

C. The spread of industrial waste to Beach #8.

D. The industrial waste reaching the intake of the City Water Works.

2. Beach #11 to be closed when wind directions are from south-east, east and north-east.

CREDITS DUE:

1. State Health Department for supplying one man to work part time in the laboratory.

2. City of Erie -- supplying man part time in the laboratory and allowing the use of a fine water works laboratory facility.

3. Public Health Service for supplying two men, equipment and media for test.

4. County Health Department sanitarians for braving the cold air and warm water to collect samples, also for a man to work in the laboratory.

Report prepared by:

Lawrence R. Moriarty
Director
Division of Environmental Health
Erie County Department of Health

ERIE COUNTY DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH

PRESQUE ISLE STATE PARK BEACHES

INTENSIVE SURVEY III -- TABLE III

September 14, and 15, 1964

AVERAGE COUNTS/100 ml

DATE	DAY	TIME	BEACH NO.	TOTAL COLIFORM	FECAL STREP.	TIME	TOTAL COLIFORM	FECAL STREP.
9/14	Mon.	A.M.	1-2	1.5	4.5	P.M.	3	1.0
			8	3	5		2	3
			10	19.5	8		3	1
			11	3372	18		5420	5
9/15	Tues.	A.M.	1-2	6.3	15.5	P.M.	5	86
			8	490	30		64	7
			10	206	29		435	4
			11	774	34		5722	4

R-2 ERIE COUNTY DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH

DATE: July 1, 1965

TO: Dr. Felix S. Shubert
Deputy Director

FROM: L.R. Moriarty

RE: 1964-65 Route #5 Stream Survey
Last in series of nine samplings

The ninth and last in a series of surveys of Route #5 streams was conducted by Mr. Jenkins on June 8, 1965. Samples were collected from a west to east direction and following a day of rain. Muddy water and the high bacterial counts are indicative of the excessive run-off. The survey results are attached.

In summing up the survey, 155 samples have been taken from 15 streams and 3 other sampling points. About 1000 miles have been driven to complete the work.

Further in summary -- the median sample for all samples for all streams crossing Route #5 during the survey was 4600 coliform/100 ml of sample. The average for same was 106,000.

The median and average count for each station is as follows:

STATION NO.	STATION LOCATION	MEDIAN	AVERAGE
A	Twenty-Mile Creek	225	350
B	Sixteen-Mile Creek	4600	5900
C	Twelve-Mile Creek	2100	4500
D	Eight-Mile Creek	1500	2400

STATION NO.	STATION LOCATION	MEDIAN	AVERAGE
D-1	Six-Mile Creek	2300	18,500
E	Four-Mile Creek	9300	19,500
F	Millcreek	350,000	515,000
F-3	Garrison Run	240,000	420,000
G	Cascade Creek	11,000	44,000
H	Walnut Creek	4600	5000
I	Trout Run	2000	3900
J	Elk Creek	24,000	55,000
K	Raccoon Creek	1100	2200
K-1	Crooked Creek	150	150
X	Conneaut Creek	1100	1100
F-2	Public Dock	3500	4000
F-1	Ship Channel	2400	3300
EI-1	Four-Mile Creek G.E. Sewer	60,000	58,000

There is no question that of the streams samples, Twenty-Mile Creek is in excellent condition, that it is affected little by human pollution. Such streams as Eight-Mile, Trout, Raccoon, Crooked Creek and Conneaut Creek also can be considered to be in satisfactory condition. It would be the writer's opinion that the counts for these streams would be due mostly to natural conditions.

Such creeks as Sixteen-Mile, Twelve-Mile, Six-Mile, Four-Mile and Walnut Creek reflect populated areas. Some waste is entering these streams causing counts to rise slightly.

These are the areas where sewage plants and waste treatment facilities should be up-dated or adequate sewage facilities should be provided for the odd clusters of homes or budding subdivisions. Enforcement of local controls on on-lot disposal and subdivision ordinances will go a long way towards preventing these streams from getting worse.

Elk Creek. The overloaded Girard and Lake City Borough sewage plants are factors in the high counts in Elk Creek. Lake City, to correct its end of the problem, is now enlarging its plant and will treat all waste adequately before it is discharged. This work should be completed within the next year. Girard Borough is presently discussing plant expansion with a consulting engineer and may have plant expansion underway in the near future.

Cascade Creek. Counts in Cascade indicate some bacterial pollution. However, visual observations indicate other contaminants. Samples collected have been given to the State Health Department for analysis. Routine checks of Cascade Creek at West 25th Street are being made with the hopes of tracing and catching the party or parties involved.

Garrison Run and Millcreek. They remain a serious problem and will remain problems until the city through a long-range program converts its storm-sanitary sewers into separate systems. The work done by the city to change overflows, fix syphons, cap sewers, etc. is quite evident in the decreasing counts obtained. The proposed trip through the two tubes by city personnel will help further to reduce pollution by the location and removal of sources of waste.

The sampling of the bay area around the public dock and the ship channel has not proved conclusively that Millcreek, Garrison Run, Cascade Creek and the bayfront area are the only cause of bacterial pollution on Beach #11 at Presque Isle State Park. There is no doubt that the combination of the four areas mentioned above do contribute to the problem, but it is realistic to assume that other sources from the lake side do contribute to Beach #11 pollution.

Summer survey work on beach areas with twice weekly sampling has already started to show high counts at Dunn Boulevard in Erie and Lakeside Beach in Lawrence Park. This indicates that this area is also contributing to the Beach #11 problem.

CONCLUSION:

The Route #5 survey was proposed in order to obtain a baseline on the general condition of streams entering Lake Erie from Erie County. It is quite apparent that the streams in Erie County, except for Millcreek, Garrison Run and Elk Creek (and possibly Cascade Creek) can be considered to be in good to excellent condition. From the standpoint of fishermen and the newspapers, many fish have been caught in all the streams except those mentioned above. The newspapers at times do report catches in Elk Creek.

None of the streams tested could be used for drinking water without chlorination and surely none could be used for a large supply unless treatment and chlorination were used. Except for Twenty-Mile, Eight-Mile, Raccoon and Crooked Creek (and possibly Sixteen-Mile Creek) none of the remaining creeks sampled should be considered absolutely safe for swimming. The results also indicate that under ideal conditions, Six-Mile Creek could be used for short periods of time.

RECOMMENDATIONS:

1. Borough of Girard go forward as quickly as possible with its plans for enlarging the sewage treatment plant.

2. That strict supervision of conditions by both bacterial and visual observation be made routinely of Millcreek and Garrison Run and that, upon any noticeable change above normal conditions, the city will investigate and correct the cause immediately.

3. That as a long-range program, a feasibility report and plan of implementation be drawn up to separate storm and sanitary sewers.

4. That this department continue to sample Elk Creek -- a program of sampling the entire creek be undertaken to ascertain if pollution beyond the limits of Lake City and Girard is affecting the stream. There would be six to eight sampling stations between the mouth of the creek and a point beyond the Middleboro area.

5. That this department, through its summer beach program, dye testing and float studies, continue to relate and ferret out conditions that affect the well-being of Beach #11.

1964-65 STREAM SURVEY

SAMPLING STATIONS*

CODE	LOCATION	REMARKS
A	20 Mile Creek	25' North of N.W. Corner of Bridge
B	16 Mile Creek	25' North of N.E. Corner of Bridge
C	12 Mile Creek	50' North of N.W. Corner of Bridge
D	8 Mile Creek	30' North of N.W. Corner of Bridge
D-1	6 Mile Creek	100' North of N.W. Corner of Bridge, Rock
E	4 Mile Creek	100' North of N.E. Corner of Bridge
EI-1	4 Mile Creek	100' South of S.W. Corner of General Electric Sewer
F	Millcreek	Center of Bridge -- West of Erie Sewage Plant Administration Building
F-1	Ship Channel	West Entrance -- near 3rd Red Tower, South Pier
F-2	Public Dock	Foot of State St. -- North of Pier
G	Cascade Creek	25' East of Foot Bridge on South Shore, Frontier Park
H	Walnut Creek	By Bottle from South Side of Road above West Tunnel
I	Avonia	20' North of N.E. Corner of Bridge on Old Route #5
J	Elk Creek	Pass Bridge to West, enter Side Road on North, go North to Creek
K	Raccoon Creek	Under North West Corner of Bridge

CODE	LOCATION	REMARKS
L	Millcreek	Glenwood Park Ave. and West 30th at Spillway
M	Millcreek	Glenwood Park Ave. and County Line East Side of Gore Road

*All stations located along Route #5 unless otherwise noted.

INTERPRETATION OF COLIFORM INDEX AS FOUND IN NATURAL WATERS OF THE GREAT LAKES AND UPPER MISSISSIPPI RIVER DRAINAGE AREA

COLIFORM PER 100 ml		INTERPRETATION
	0	Water Sample free of pollution
Not more than	1	Treasury Department standard for drinking water
	10 to 100	Indicative of good water -- normal for inland lakes and Great Lakes which are free of sewage pollution
	100 to 500	Normal for inland streams, free of detrimental sewage pollution, might be attributed to land wash
Not satisfactory for swimming	1,000	Suspicious -- generally indicates mild pollution in natural waters, but dangerous in proximity to fresh sewage pollution
Not satisfactory for swimming	10,000	Definite evidence of fresh sewage pollution -- menace to health
"	100,000	Heavy sewage pollution -- definitely dangerous
"	1,000,000	Normal Sewage

The above standards were agreed upon for interstate use by the Great Lakes and Upper Mississippi River Drainage Basin Board of Engineers.

Reference can be found in "Coastline Pollution Surveys of Michigan, June 1933" Report of Michigan Stream Control Commission.

ERIE COUNTY DEPARTMENT OF HEALTH -- DIVISION OF ENVIRONMENTAL HEALTH

1964-65 STREAM SURVEY

LOCATION — DATE AND COLIFORM PER 100ml

	12-23-64	1-12-65	2-2-65	2-23-65	3-16-65	4-7-65	4-28-65	5-24-65	6-8-65
A	240	210	--	23	--	150	--	240	1100
B	1100+	11,000	11,000	2400	930	11,000	11,000	430	4600
C	1100+	11,000+	0	930	11,000	2100	930	2400	11,000+
D	1100	1100+	930	1500	4,600	430	4,600	2400	4600
D-1	1100+	1100+	2300	1500	24,000	910	2300	4300	110,000
E	1100+	4600	2300	2400	11,000	11,000+	24,000	9300	110,000+
F	110,000+	1,100,000+	1,100,000	150,000	1,110,000	240,000	460,000	1,110,000	1,100,000+
F-1	1100+	4600	--	--	--	--	2400	11,000+	4600
F-2	1100+	4600	4600	11,000	2400	2400	4600	2400	4600
G	1100+	11,000	11,000+	11,000+	* --	--	--	--	--
H	1100	1100+	4600	430	91	4600	11,000	11,000	11,000+
I	1100+	11,000+	1500	7500	1500	7500	2000	2300	910
J	1100+	11,000+	15,000	110,000+	24,000	4300	110,000	110,000+	110,000+
K	1100	1100+	1500	430	230	--	11,000+	3900	360
G-1				(2-19-65) 11,000+	110,000+	9100	23,000	9100	240,000
F-3	GARRISON RUN				240,000	110,000+	240,000	--	1,100,000+
San.	Moriarty	LRM & CW	Wilt	CW & JG	Granahan	JG & NC	Colonna	NC & RJ	Jenkins

* Now G-1 (new sampling point)

ERIE COUNTY DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH

RESULTS -- 1965 SUMMER BEACH SURVEY

Coliform /100 ml

DATE	BEACHES							
	DUNN BB6	HALLEY BB5	SHADES BB4	SHOREWOOD BB3	FREEPORT BB2	ST. BARN. BB1	MEDIAN	AVERAGE
May 5/14/65	--	11,000+	--	--	--	--	--	--
June 6/10	21,000	110,000+	4,600	4,600	930	11,000	7,800+	25,000+
6/15	110,000+	460,000	930	750	2,400	230	1,700+	96,000+
6/17	110,000+	9,100	230	2,400	230	11,000+	5,800+	22,000-
6/22	2,300	75,000	930	930	430	230	930	13,000
6/24	110,000	1,100,000+	11,000+	11,000+	930	11,000+ or 46,000	11,000+	207,000+
6/29	24,000	1,100,000+	11,000"	11,000+	930/930	11,000+	11,000+	193,000+
July 7/1	46,000	110,000+	2,400	430	2,400	2,400	2,400+	27,000+
7/6	460,000	23,000	4,600	430	2,400	3,600	4,100	82,000
7/8	9,300	460,000	24,000	930	~~(3 - 1.0)~~ 230	~~(3 - .1)~~ 4,300	6,800	83,000
7/13	~~(3 - 0.01)~~ 1,100,000+	~~(3 - 0.01)~~ 9,100	~~(3 - 0.1)~~ 930	~~(3 - 1.0)~~ 2,400	~~(3 - 1.0)~~ 430	~~(3 - .1)~~ 9,300	5,750	187,000+
7/15	1,100,000+	1,100,000+	11,000+	1,500	430	24,000	17,500+	373,000+
7/20	~~(3 - 0.01)~~ 1,100,000	~~(3 - 0.01)~~ 290,000	~~(3 - 0.01)~~ 910	~~(3 - 1.0)~~ 430	~~(3 - 1.0)~~ 930	~~(3 - 0.1)~~ 4,300	2,600	230,000
7/22	1,100,000	9,100	91	430	36	0	260	185,000
7/27	~~(3 - .01)~~ 1,100,000+	~~(3 - .01)~~ 1,100,000	~~(3 - .01)~~ 9,100	~~(3 - 1.0)~~ 1,500	~~(3 - 1.0)~~ 230	~~(3 - .1)~~ 0	5,300	368,471
7/29	1,100,000	1,100,000+	43,000	4,600	210	46,000	44,500	52,301
Aug. 8/3	~~(3 - .01)~~ 240,000	~~(3 - .01)~~ 1,100,000+	~~(3 - .01)~~ 1,100,000	~~(3 - 1.0)~~ 11,000+	~~(3 - 1.0)~~ 460	~~(3 - 1.0)~~ 460	125,500+	408,653
8/5	43,000	43,000	0	11,000	91	0	5,545	16,181

R-4 ERIE COUNTY DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH

LAKE ERIE
WATER POLLUTION
ERIE COUNTY, PENNSYLVANIA

DRAINAGE AREA

For the sake of argument, Erie County is divided into two drainage areas. An imaginary line running diagonally (north-east) through the townships of Elk Creek, Franklin, McKean, Summit, Greene, Greenfield and cutting the lower south-east corner of North East township in general divides the drainage areas. The south portion of the county eventually drains to the Ohio Valley. The north portion of the county drains to Lake Erie. Except for general comment now and then, little will be said in this discussion about the south portion of the county.

POPULATION DISTRIBUTION

In the Ohio Valley portion of the drainage area in Erie County some 30,000 people populate the area. There are approximately 220,000 people in the Lake Erie drainage basin according to the 1960 census.

SEWAGE TREATMENT PLANTS

In the Lake Erie drainage area there are publically-owned and operated sewage treatment plants in the boroughs of North East, Lake City, Girard and Albion. These communities service approximately 10,000 people.

The City of Erie in its own sewage treatment plant processes waste from the Borough of Wesleyville, the townships of Lawrence Park and from portions of Harborcreek and Millcreek. The total waste treated from the City of Erie, Wesleyville, Lawrence Park, Harborcreek and Millcreek comes from a population of approximately 160,000. Therefore, approximately 170,000 people are serviced by public sewerage facilities in the Lake Erie drainage area. One additional community will be served by public sewers in the near future (Cranesville - 600).

There are four public plants in the Ohio Valley drainage area catering to approximately 15,000 people (Corry, Edinboro, Union City and Waterford*).

PACKAGE PLANTS

Semi-Public Sewage Disposal Systems. There are some 16 package-type plants in operation, 5 such plants are under construction or under permit awaiting the proper time to start construction and 7 package plants are proposed for the Lake Erie drainage area. These plants are built in areas not accessible to the out-stretched laterals of a public system. They may be considered as interim plants until public systems become available.

The plants in operation were designed to accomodate a population equivalent of some 3000 people for such places as gas stations, motels, restaurants, etc. and a population of 3000 for such facilities with stationary population as schools, institutions and industries. (See Table I)

*Under construction.

TABLE I

PACKAGE PLANTS IN OPERATION

GAS STATION & RESTAURANTS:

1. Larry's Economy (175)
2. Stouffer's (130)
3. Green Shingle (100)
4. Terrace (120)
5. Talerico (550)

SCHOOLS:

6. F. S. Clark (400)
7. Behrend Center (930)
8. Summit-Robison (300)
9. Fairview High (575)

INDUSTRY:

10. White Sewing Machine Co. (165)

MOTEL & RESTAURANT:

11. Howard Johnson (420)
12. Holiday Inn (not open) (400)

STATE PARK:

13. Presque Isle Boat Marina (1000)

INSTITUTIONS:

14. Erie County Hospital (500)
15. Rondale Nursing Home (100)

GAS STATION:

16. Carney's (90)

The plants under construction will have an estimated population equivalent of 600 for transients and 900 for local people. (See Table II)

Proposed package plants in the Lake Erie drainage basin would accomodate approximately another 1700 people, 1150 of these would be permanent residents of Erie County.

One other method of treating sewage is in use in the Lake Erie drainage area and that is a stabilization pond for a subdivision of 120 homes. Presently there are 10 homes in use in the subdivision with about 30 people occupying same.

In summary then -- sewage is treated in the Lake Erie drainage basin in the following manner and for the following population:

1. Public sewerage systems	170,000
2. Package plants	3,000
3. Stabilization ponds	30
Total	173,030

Under construction:

1. Public sewerage systems	600
2. Package plants	900
Total	1500

TABLE II

PACKAGE PLANTS UNDER CONSTRUCTION

MOTEL & RESTAURANT:

1. Travelers' Inn	400

SUBDIVISION:		
2.	Greenbriar	200
GAS STATION AND RESTAURANT:		
3.	Pure Oil (90 and 20)	200
SCHOOLS:		
4.	Klein	400
5.	Green Township (1500)	300
	Total	1500

PROPOSED PACKAGE PLANTS

GAS STATION & RESTAURANT:		
1.	Seaway	200
2.	Pasche	300
SCHOOL:		
3.	St. Boniface	450
INSTITUTION:		
4.	Gospel Hill Nursing Home	100
SUBDIVISION:		
5.	Lake Shore	500
MOTELS:		
6.	Conner's (Route 19)	50
7.	Weindorf	100
	Total	1700

Stabilization Pond (in operation):

Georgetown Heights Subdivision	30
(Potential)	320

This would indicate that by the end of 1964 approximately 175,000 or 80% of the Lake Erie drainage basin will have sewerage systems treating domestic waste.

The other 45,000 people because of their location will be in areas of partial control of waste disposal by means of local sewage ordinances. Still others, transients namely, (3600) not considered in the total above will be more or less under constant control of sewerage systems along Route 90 and in recreational areas.

THE NEGATIVE SIDE

On the negative side of domestic sewage treatment, we can assume that all mechanical equipment will not function to its utmost at all times and the quality of maintenance and operation, will vary to give a degree of treatment a little less than the ultimate desired.

The approval of subdivision plots by townships without regard to type of ground or the installation of a sewage treatment plant or Health Department approval creates an ever-increasing threat of keeping up with pollution abatement. This type of action necessitates big sewer expansion programs to eliminate sewage nuisances and health hazards.

A planned sewer program and sewage disposal by a new subdivider would eliminate future sewage and health nuisances and require the home purchaser to pay for a sewerage system once and one time only. An ordinance would keep pollution under control before it started.

There are approximately 3 to 5 FHA-VA on-lot sewage disposal applications approved each year by the Erie County Department of Health. This is an indication of the type of soil in the county and reason for the need of local or county control over individual household on-lot sewage disposal systems. Having an ordinance and not enforcing same is a detriment also to future pollution control.

Domestic sewage creates a few outstanding problems in such areas as Brookside and the Fairfield areas of Harborcreek Township, Lake Shore subdivision of Fairview Township and McKee Road, Spires Drive, West 32nd Street and Colonial Avenue in Millcreek Township, to name a few.

Only major sewer expansion programs will correct the flow of pollution from these areas to the lake. To this end, Harborcreek Township has a committee of prominent men studying the problem and shortly should come up with a recommended program for abatement.

Fairview Township Sewer Authority took up the problem of pollution abatement for Lake Shore subdivision but of late have not shown any noticeable activity for solving the problem. Millcreek Township is in the process of governmental red tape trying to obtain funds for detail plans for a two or three million dollar sewer expansion program. The City of Erie, by the chlorination of its sewage plant effluent will reduce the bacterial load to the lake.

In summarizing pollution to Lake Erie from the domestic standpoint, sewage treatment facilities and lack of sewerage systems Erie County can well be proud of the effort being made to abate pollution to Lake Erie.

It is quite apparent that Erie County is not letting its raw domestic sewage run "whole hog" into the lake. Yet it is also apparent that steps must be taken to control subdivision expansion without proper sewage disposal, that sewage ordinances must be enforced and that, in areas where public sewers are not available or practicable, use of such interim devices as package plants and waste stabilization ponds be used until such time as public or metropolitan-type waste treatment facilities are made available.

INDUSTRIAL WASTE FACILITIES

The major share of industrial waste to Lake Erie comes from the City of Erie area. One tannery in Girard Township, after treatment, periodically discharges a highly-colored waste to Elk Creek, thence to the lake. After pretreatment, waste from the grape industry in North East is discharged to Sixteen-Mile Creek and also to Lake Erie. In essence, these are the only major sources of treated or untreated waste to the lake by industrial facilities in the county. These industries operate under state permit.

A few plants in Lake City and Millcreek Township empty their waste into the public sewerage systems for treatment before being discharged to the lake. A few gravel washing operations in the county, also under permit to the state, are required to presettle waste water to prevent silt from depositing in streams.

Minor pollution outbreaks have occurred in the county from industrial waste by-products being deposited on the surface of the ground. Fly ash, from power plants, deposited in Harborcreek and Millcreek has, because of seepage, turned small streams rusty and lowered the pH. Wood waste from the paper mill deposited in the Harborcreek area caused pollution when seepage from the wood pile broke dykes and allowed heavily polluted colored waste to enter a nearby stream.

Many industries in the City of Erie deposit their waste in the city sewerage system for treatment before discharge to the lake. The iron works pre-treats its waste to remove sediment and phenol compounds. On occasions, such pollution escapes to the lake. The paper mill which has been experimenting with waste treatment facilities for over ten years, continues to discharge large quantities of waste to Lake Erie far in excess of the population equivalent of the total domestic output of the City of Erie sewage treatment plant. This waste adds fibers, color and causes foam.

Minor wastes, such as: chromium, acid, hot water, oil, etc. are also discharged in minor quantities to the Presque Isle Bay and to the lake.

Cooling water, while not apparent as a factor in pollution, may in winter time accumulate enough heat that when discharged to the receiving water act as an attractant to fish. Large quantities of fish, so attracted and dying off, through decomposition, pose a problem in pollution abatement. The decomposition process may be a factor in lowering oxygen levels and supplying a continued source of nutrients for algal growth.

While population equivalent figures are not available for all industries in the Lake Erie drainage area, it would be safe to assume that such waste contributes at least 600,000 population equivalent to the lake and may be as high as 700,000 or higher of untreated waste.

Comparing 600,000 for industry with no treatment, to 175,000 people with treatment and that portion of 45,000 that in some way their waste gets into the lake, it is quite easy to rationalize that industry is contributing at least ten times as much raw waste as is the domestic population. In other words, for every 60,000 people, industry is dumping into Lake Erie the equivalent of 600,000 people.

This is not quite the picture that has been painted in the past. Pollution has been lumped in one big package and we talk of it in terms of bacteria, detrimental to health and closing down beaches and with a side look at the public as the source of all trouble.

AGRICULTURE

Some may wonder after what has been said about waste from people and industry as to what is happening to the lake because of agricultural regions in the Lake Erie drainage area. There is no way except for long-range and intensive stream surveys to determine off-hand how much pollution in the form of nutrients (fertilizer) and poisons (insecticides, herbicides, etc.) is contributed to the lake in a given cycle or area.

Heavy growths of algae in some streams entering the lake from farm and orchard areas are indicative of fertilizer run-off. Such fertilizer, while at first may not appear as a pollutant, can indirectly contribute to massive growth of algae which in turn, as many along the lake front will attest, dies off, collects in the most selective coves, beaches, etc., then decomposes to the knowledge of everyone within smelling distance. Such decomposition is the source of pollution and new nutrients for future algae growths in the lake.

Contrary to popular belief of the average lay person, algae in its growing state is a credit to the lake and a pollution abater. Algae must have sunlight, carbon dioxide and nutrients to grow and produce oxygen in a water soluble form. Dissolved oxygen is a factor in pollution abatement.

Fishermen may not agree with this theory, but for only another reason, heavy growths of algae may cover breeding areas but, on the other hand, algae in some cases affords protection for the small fry.

Insecticides, pesticides, herbacides, etc., if uncontrolled and used indiscriminately, will react and cause fish kills -- these are usually quick and sensational. Such kills attract newspaper publicity and arouse the indignation of the general public.

Such kills on a creek in Erie County by comparison may be minor to damage being done by other waste, yet the fish kills are not necessary and little by little contribute to the overall degradation of the lake.

At this time, there is no information readily available to the Erie County Health Department as to the magnitude of agricultural pollution to Lake Erie but algae growth and fish kills here and there point out a problem does exist.

ALGAE

Agricultural waste is not the only contributor of nutrients to the lake. Treated and untreated domestic sewage and some industrial treated and untreated wastes provide nutrients for algae growth. As mentioned above, algae is a "helper" in abating pollution when it is growing, a luscious green growth is indicative of help. Nutrients in the form of nitrogen and phosphates promote the growth. It is the decomposing waste that causes the pollution and esthetic problem along the lake front.

Until the time arrives that these nutrients are controlled at their source and the lake by dilution eliminates its present storage of nutrients, algae will always be a problem in Lake Erie.

The Ontario Water Commission in its studies of spot control of algae have been successful in eliminating the growth in certain areas. However, as soon as chemical additives wear off, the algae reestablishes itself.

It would be impractical and uneconomical, unless some new impediment to algae growth is discovered, to completely treat any or all of the Great Lakes with chemicals for algae control. Local control is illogical also, because it's like the man with the dandelion-free lawn trying to cope with the situation when all the neighbors around him care little about the little yellow flower.

SWIMMING-BEACHES

Locally there is a problem which rotates around the use of Beach 11 at Presque Isle State Park. When I say locally, it is a local problem and not one of concern for the whole lake front. The various communities along the lake have their own pollution problems, as was evident this past summer in the newspapers when beaches were closed.

The local problem revolves around: pollution from the bay, unchlorinated sewage treatment plant effluent, industrial waste, lake currents and wind directions. The history of the state park beaches and county beaches west to the Ohio state line is a good and envious one because of low bacteria counts and far and in-between high counts.

However, the history of pollution at potential beach areas east of the city of Erie to North East (Lawrence Park and Harborcreek Townships) and Beach 11 at Presque Isle State Park has at times been mediocre and at times very bad. This has necessitated closing Beach 11 and recommending beaches in the Lawrence Park area not be used. These circumstances of good west side - poor east side strongly indicate it is a local problem and must be corrected locally.

Bacteria alone is not a criteria of what constitutes good bathing water. This is true also of drinking water. From the esthetic viewpoint, people do not like to bathe in highly-colored or foamy water nor do fishermen relish putting their equipment and boats through this type of contaminant. The only good factor about color and foam is that a person on Beach 11 or one at the township beaches has a visual aid indicating that pollution is being carried his way.

With the addition of chlorine to the sewage treatment plant effluent, quick and proper treatment of industrial waste and the cleanup or prevention of future pollution to Presque Isle Bay, not only will Beach 11 be made a better place to swim, but miles of lake front bordering on Lawrence Park, Harborcreek and North East Township, because of their recreational availability will become a tourist attraction.

SUMMARY

From the above, it is apparent that pollution does exist in the lake, it affects the economy of the local people, the pleasure of our visitors and gives Lake Erie a "black eye." Local people, through their community in a sense, are partially to blame. Industry can accept more than its share and public officials can shoulder the blame for lack of enforcement or enactment of laws to prevent present and future pollution.

CONCLUSIONS

WHAT IS BEING DONE:

FEDERAL LEVEL. An extensive and very comprehensive survey of Lake Erie is being done by the Public Health Service. This is a realistic program to give the over-all picture of pollution in the lake. The results, if listened to and followed by the states, will have far reaching effects on making Lake Erie as well as the other Great Lakes as pollution free as possible.

STATE LEVEL. The Sanitary Water Board and State Health Department has one of the best records in the nation in combating pollution. While their efforts may not look or appear sensational, their continued program of surveillance, checking, evaluating and approving permits for sewage and industrial waste treatment has made Erie County and its lake front a better place to live. Lack of enforcement on their part would leave pollution in an intolerable state in this area. Mr. Harvey of Meadville deserves much credit for handling this program over the years.

A constant watch by game and fish commission personnel of the waters of the Commonwealth is a factor in checking existing pollution and indirectly preventing similar pollution.

LOCAL LEVEL. County Health Department -- Promotion of sewage disposal, on-lot and subdivision ordinances to control waste treatment has long been the program of the department. Promotion of public sewerage systems in communities where needed and package plants in out-of-the-way places takes up considerable time of the department. Minor surveys of stream and lake front areas are carried out to determine location of pollution problems.

Boroughs, Cities and Townships -- Enactment of sewage ordinances, building of sewerage facilities (particularly boroughs) and extension of sewers constitute some of the activity of these municipalities. The increase in the number of sewer authorities in the past few years attests to the desire to look into and abate pollution. (Some times I wonder if sewer expansion programs are not aimed at the people's comfort rather than abating pollution to streams and lakes.)

Organizations -- Numerous organizations dealing with recreation, conservation, boating, fishing, etc. do much to arouse the public into thinking about the problem at hand. The aroused public are the one that eventually have laws enacted which in turn help states and local officials abate pollution.

WHAT CAN BE DONE

LOCALLY -- To solve our own problem.

1. Industry, without further delays, assume its full responsibility and remove all waste from the lake. This should be a crash program -- not one of experiment and delay.

2. Passage of county ordinances controlling sewage disposal for subdivisions and other establishments and necessitating approval of such installations by the County and/or the State Health Departments.

3. Adoption and specifically enforcement of sewage ordinances for on-lot disposal of waste by townships and boroughs. Under such an ordinance, homes will not be built on property not suitable for subsurface disposal.

4. County Health Department to encourage extension of sewers into areas greatly needing waste treatment facilities and to enforce subdivision ordinance regulating sewage disposal.

5. A joint effort by State-County-City Health Departments to eliminate sources of waste to and prevent new pollution from transient visitors from entering Presque Isle Bay.

6. Local organizations to voice their opinions where and to whom it is needed in the form of resolutions.

STATE -- Continue program requesting proper installations and new installations of sewage and waste treatment facilities and requesting correction of existing pollution in problem areas. Heed the federal report when it is published.

FEDERAL -- Continue survey work and coordinate overall efforts of the states to improve the lake.

In conclusion, Erie County has its own problem to lick in relation to pollution as it affects our beaches, recreation and tourism and a joint effort with the other states to lick same as it affects fishing and future water usages.

Report prepared and written by:

Lawrence R. Moriarty, Director
Division of Environmental Health

Approved by
Dr. Felix S. Shubert
Deputy Director
Erie County Dept. of Health

Presented to County
Commissioner, Feb., 1964

IZAAK WALTON LEAGUE OF AMERICA, INC.

R.D.2, Franklin, Pa.
9 August 1965

TO: U.S. Public Health Service

SUBJECT: Great Lakes Pollution

In care of Mr. Charles L. Wilbar, Jr. Chairman
Sanitary Water Board
Commonwealth of Pennsylvania
Box 90
Harrisburg, Pa. 17120

Dear Sirs:

The Izaak Walton League of America conducted a survey of the Great Lakes in 1959 with Canada cooperating with Mr. Dave Kuck of Chicago as chairman. At that time, our survey of Pennsylvania's shoreline on Lake Erie revealed a great deal of pollution, mainly from Hammermill Paper Co. in Erie, Cascade St. Conduit sewage from Erie, houseboat sewage in the bay at Erie and four canneries polluting Sixteen Mile Creek at North-East, Pa.

At present, the conditions are not nearly as bad. We still have pollution from Pennsylvania, and oceangoing ships were supposed to dump their sewage and bilge water into facilities to be constructed at Duquesne pier in Erie.

My last talk with Dr. Maurice Goddard revealed these facilities had not been constructed yet although they were part of the plans presented the public when appeal for funds for Duquesne pier was made.

As you know, our 1959 survey conducted in cooperation with the Penna. Fish Commission here in Penna. revealed Hammermill Paper Co. as being a chronic polluter of Lake Erie and we requested State Attorney General to prosecute.

Citation was issued to them, and they are now experimenting with pumping pollution underground which will not be the final answer to their problem I am sure. Even a sponge will only hold so much water.

Am happy to see official Federal survey being conducted and urge cleanup of conditions you find.

Yours for
"The wise use of our Human and Natural Resources",

Roy T. Frank - Chairman
Penna. Div. of I.W.L.A.
Great Lakes Pollution Committee

copy - Gregg, Fraley

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CHAIRMAN STEIN: If we may now go on with the Federal presentations, Mr. Poston.

MR. POSTON: Thank you, Chairman Stein.

Conferees, members of this conference. I think that the conferees in their deliberations at Cleveland have taken a great step towards implementation of a clean-up program for Lake Erie's pollution. I sincerely hope that here at this conference we can have an equally cooperative agreement and progress can be made here at this conference in Buffalo in the same manner.

The Public Health Service can contribute significantly to this conference, in terms of causes of pollution and damages from pollution, and of the Lake Erie pollution problem. For this purpose, technical people of our Public Health Service have been studying the pollution problem of Lake Erie from end to end -- at Buffalo and at Erie, Cleveland, Toledo and Detroit. These studies have involved broad categories of scientific and technical people -- bacteriologists, chemists, oceanographers, hydrologists, data processors and engineers. We have prepared the report in three parts, which is available at the front desk. It was there this morning, at least.

We would like to present this report to you in break-down form, and for this purpose, Mr. Grover Cook and Mr. Megregian will make this presentation. However, prior to this, we have asked Dr. Clarence Tarzwell, Chief of our Biology Research with the National Marine Quality Research Laboratories, to make a presentation on changes in Lake Erie.

I'd like to present to you at this time Dr. Tarzwell.

DR. TARZWELL: Mr. Chairman, Members of the Committee, ladies and gentlemen:

The environmental problems facing us today have no easy solution but they are of great importance to all of us now and in the future. Can we maintain a desirable environment for ourselves and generations yet to come? Are deteriorating soil, air, and water resources a necessary result of our so-called progress? Must we accept unsightly, odoriferous, and contaminated streams and lakes as an inevitable result of the growth of population and the development of our industries? In the past many accepted this view of the problem and felt that it would be essential to dedicate certain of our streams solely as sewers for the carrying off of wastes. I do not believe that we can afford to do this. In the future, at least in many areas, we will need all available water for municipal supplies, and these streams must be cleaned up so that they are suitable for such use.

During the past half century, in our rush for immediate creature comforts and the so-called better things of life, many of us, especially those living in the larger cities, have forgotten the environmental conditions under which we have evolved. Little consideration has been given to the effects of our activities on our overall environment. Man has now attained the ability to significantly alter or damage his environment. Significant damage has already been done either knowingly or unknowingly. Wastes of an ever-increasing variety, volume, and complexity are being discharged into our air and water with little consideration of their direct, let alone their indirect or long-term effects on our environment and well-being.

Since the turn of the century, there have been the voices of conservationists crying in the jungle of resource exploitation, waste dumping, and the fast buck. However, in recent years with the great increases in the numbers, complexity, and quantity of our wastes, these voices have become louder and more persistent. That we cannot indefinitely pour our untreated wastes into the lakes and streams from which we take our water supplies has been forcefully brought to the attention of the general public. Finally, at least a portion of the public has been awakened to the threat to our general well-being, health, and welfare. We hear more and more about abatement and prevention of pollution. Pollution is now a widely discussed subject. But what do we mean by pollution? When is a water polluted? It is apparent that this now widely used term has different meanings to different persons and groups. There is no general agreement as how to define pollution, what it is, or where it exists.

Some define pollution as any departure from the primordial conditions. They believe that any change in the composition of the aquatic biota constitutes pollution. It is impossible to bring all of our streams back to the conditions which existed when the country was forested. Further, I am not sure that we would wish to do this even if it were possible. Modern agriculture has demonstrated that a change in the flora can be very beneficial to man. We now raise larger crops than were thought possible one hundred years ago. I feel that such a definition of pollution is impractical.

Others have defined pollution as any change in the quality or character of a stream. Such a definition is not always applicable. For example, let us consider two streams, one draining a limestone area and having hard water and the other draining a sand-stone area and having soft water. Each of these streams is pure and has a good fauna. After their junction, the resulting streams also have a good fish fauna. However, the character and quality of each water have changed, but we cannot say that the resulting stream is polluted. Another Example. Let us say that pure warm water is added to a stream in Glacial National Park where many of the streams are naturally so cold that even the trout do not grow well. This warm water would increase production and the growth of the trout. If the production of fish is our objective, how can we say that the warming of the water is pollution if it is beneficial.

Some consider the addition of any material to a stream as pollution and classify the materials as pollutants. Again such a definition is not always applicable. If this were a true definition of pollution the addition of distilled water would constitute pollution. The addition of certain compounds such as phosphates, nitrates, calcium carbonate, potassium, and other earth elements would be classified as pollution under this definition even though the addition of these elements may fertilize the stream and result in increased productivity. The mere addition of these materials is not always pollution. However, fertilizing materials can be added in excessive quantities so that they bring about undesirable conditions which harm the use of the water. In this case they would be pollutants.

Some have maintained that the addition of any toxic materials constitutes pollution. This also is not necessarily true. Trace elements in water, such as copper, zinc, molybdenum, iron, magnesium, iodine, manganese, boron, and selenium may be actually beneficial since all of these elements are among those needed for life. They become toxic and harmful only when they are added in concentrations which exceed the maximum safe level or needed levels. Thus the key consideration is how much and what is added and not the mere addition. Even table salt which is necessary for life becomes a toxic when added in excessive quantities as evidenced in the baby poisoning case in the hospital where salt was mistaken for sugar and placed in the babies' formulae. Further, a material which may be harmful for one use and thus cause pollution may not be harmful for another use. Let us take for example a sewage waste. If we add sewage in small quantities to a stream used for navigation or power, it has no real effect and, in fact, may be considered as neutral. However if we add small amounts of sewage to a barren trout stream it will serve as a fertilizer, enrich the stream, increase production of food organisms, and in turn increase the crop of trout. If our objective is trout production, such additions cannot be considered pollution. On the other hand if the same amount of sewage is added to a stream used for domestic water supplies it will contaminate the water, interfere with its use, and thus be considered as pollution. Thus we see that the amount added and the desired use are important since a material may be beneficial for one use and harmful to another. We can overfertilize and burn our potatoes or kill our grass and likewise we can add too much nutrient materials to a water and produce undesirable growths. The key to this question is the desired use of the water. For each use we want water of a quantity and quality suitable for that use. In view of these considerations I have formulated my own definition of pollution which results from man's activities. I believe that pollution is the addition of any material or any change in the quality or character of a water which interferes with, lessens, or destroys a desired use. Without some harm to a desired use there is no pollution.

In abating pollution it is essential that concentrations of materials are kept below levels which are harmful or toxic. It should be remembered that toxicity is a quantitative term since toxicity depends on concentration or the amount taken up. Thus the simplist definition for pollution is "too much." Thus discharging amounts of material to a stream which exceed the maximum concentrations which are not harmful is not a use of that water, but a misuse or abuse, and constitutes pollution.

Today we are considering the question: Is Lake Erie receiving too much? It is misused, abused and polluted. We have heard much of eutrophication, a term which has long been used by limnologists. Like pollution this is another term which is not well understood.

To define this and other terms and to understand the things that are happening in Lake Erie, it would be well to consider small lakes where changes are more rapid, well defined and more easily observed. Glacial lakes can be likened to man in that they have birth, youth, maturity, old age and death. In this North Central area, lakes were created or born in glacial times. During their youth or oligotrophic stage they were clear, had abundant oxygen throughout their depth, were relatively infertile, and usually supported a good population of salmonid fishes. As they became older, nutrients and silt washed in from the watershed collected in the shore areas forming shallow bays which were favorable for the development of rooted aquatic plants. As these deposits and the plant beds increased in extent, the water became richer, plankton populations increased, and the bottom and its biota became more favorable for warm-water fishes. As organic materials from plankton, rooted aquatics, and other substances washed into the lake and accumulated on the bottom in deep-water areas there was an increase in the oxygen demand and a gradual decrease in the DO content of the water of the hypolimnion. The quality of the fish population changed with the bass and perch families increasing in abundance. As this stage developed, the lake reached maturity which is known as the eutrophic stage. Thus eutrophication is the aging of a lake with enrichment and a change in the biota. Eutrophication of many lakes is now being greatly speeded up by man's activities which bring about the addition of large amounts of organic materials. As the lake becomes older, shallow areas are filled, more and more silt accumulates, vegetation beds extend further and further into the lake, filling as they advance. Shore and marsh vegetation advances behind the rooted aquatics and the lake becomes more acid and reaches old age or the dystrophic stage. As this stage advances in a small lake a quaking bog develops on which shrubs grow and these continue to progress towards the center of the lake. The water becomes highly acid and the number of fish species are reduced until finally only two remain, stickleback and the mud minnow. Finally even these give up to the brown acid waters. The encircling tamarack trees move in an ever-tightening ring, the quaking bog covers the entire water surface and finally the lake is completely filled and becomes a meadow. I am sure that you have seen the small inland lakes of Minnesota, Wisconsin, Michigan in all stages of this evolution. Generally speaking, this aging or eutrophication, dystrophication and destruction is measured in geological time; however, through man's activities it can be greatly speeded up. In some of our inland lakes great changes can be noted in a single lifetime. As the lakes are enriched through the addition of organic materials and other nutrients, these materials find their way into the bottom materials of the deepest water or hypolimnion which is the area below the thermocline which is not usually circulated except at the spring and fall turnover. Above the thermocline is the epilimnion which is the zone of water which is circulated and mixed by the wind. The epilimnion contains the warm oxygenated water. Between these two bodies of water, the epilimnion and the hypolimnion, there is then an abrupt change of temperature. This zone is known as the thermocline. In fall and spring when all lake waters come near to the same temperature the wind is able to circulate the whole lake and we have the turnover. At this time in the spring the deeper water layer - the hypolimnion - receives the oxygen that must last all summer. As the organic materials increase in this deep zone, bacterial action puts an ever increasing demand on the dissolved oxygen in this water and as enrichment advances each year there is a greater depletion of DO. In time the DO is used up. Then aerobic decomposition ceases and the task is taken over by anaerobes which can live in the absence of free oxygen and anaerobic decomposition prevails. Under anaerobic conditions there is a change in the redox potential - the oxidation reduction potential - and many materials are changed so they come back into solution. When anaerobic conditions develop changes in the lake speed up.

It seems that everyone, when looking for a cottage site, prefers a clean, clear, gravel and sand-bottom lake with fine sand beaches free from vegetation. When someone builds on such a lake it is not too long before others also build and eventually there is a row of cottages around the lake and before long perhaps two or more rows. Then changes are noted. The water becomes more turbid, rooted vegetation occurs in the bay, plankton becomes abundant, vegetation is washed up on the beaches in wind rows and unsightly conditions develop. There is a change in the abundance of different species of fishes with the salmonids and fine fish decreasing while the coarse fishes increase. The cottage owners wonder what can be happening in the lake and may adopt the use of herbicides and algicides for the control of vegetation. But this doesn't meet the problem because they simply kill forms which, upon decomposition, furnish foods for another generation. Generally they blame anything and everything for their troubles except the effluents from their own septic tanks which are enriching the lake.

The municipal wastes which are being discharged into our Great Lakes add nutrients which greatly exceed those originally coming from the drainage basin. Changes which formerly were measured in geological time can now be noted in the short span of a generation. Lake Erie is especially susceptible to such chage or aging for several reasons. It is the southernmost and warmest of the Great Lakes. It is also the shallowest and consequently has the least deep water below the thermocline which serves as a reservoir for dissolved oxygen. In the western end in particular, it is so shallow that wind action can almost continually or at least periodically circulate the water, bringing up nutrients and materials which in deeper lakes collect in the bottom in deposits and are circulated and made available to the biota only at the spring and fall overturns. In addition, the great concentration of population around Lake Erie has increased threefold since 1916. Industry has increased six- to sevenfold in the same time. Some 12 million pounds of suspended solids are added to Lake Erie each day. Each day Lake Erie receives 174,000 pounds of phosphates and 820,000 pounds of nitrogen compounds. Two-thirds to three-fourths of these materials enter the Lake directly as municipal wastes.

Formerly it was through that the addition of these materials had no effect on the deep-water areas of the Lake and the only effect was a local one. No changes were detected in the deep-water open areas. However, it is now evident that these materials were accumulating in the bottom materials of the lakes and have now accumulated to such an extent that they are drastically influencing dissolved oxygen levels in extensive areas.

Rapid and significant changes are being produced in Lake Erie. Bacterial contamination has become so widespread that several of the beaches have been closed. Rooted aquatic plants have increased greatly in extent and density, and in some bays they interfere with swimming, boating, fishing and have been thrown up in wind rows along the beach to form odoriferous, unsightly masses. Filamentous algae, which you may have sometimes noted on the oars of your boat as long, slimey strings, have also increased to such an extent that it interferes with swimming, boating, and fishing and is undesirable from the aesthetic sense. Plankton, that is, the small microscopic free-floating or free-swimming plants and animals, has increased greatly in numbers. From 1938 to 1942 plankton populations on Lake Erie have on the average increased three-and-one-half times. There has been a six- to sevenfold increase in plankton populations in the Cleveland area. In addition, the composition of the plankton has changed with the more desirable diatoms becoming less abundant and the less desirable blue-green algae increasing in abundance. Some blue-green algae cause undesirable tastes or odors in water supplies. Others produce unsightly conditions, often collecting in such numbers that they make the water look like green paint. At times they may collect in wind rows on the beach and become a nuisance.

During the past few years there has been a marked change in bottom materials and bottom organisms in western Lake Erie. Organic materials have collected on the bottom to such an extent that their breakdown by bacterial action has depleted or used up the dissolved oxygen in extensive areas. In western Lake Erie, mayflies were practically exterminated in the fall of 1953, and there was a serious depletion of caddisfly larva in 1958. The reduction of these and other large insects which are of outstanding importance as fish food has had a detrimental effect on certain fishes. These insects have been replaced by Tubificids or bloodworms and fingernail clams which are much less desirable as fish food. Fertilizing materials have increased in the bottom deposits and phosphates have now reached concentrations of 1500 to 3000 ppm dry weight of bottom materials. This represents a tremendous store of nutrients which, if released to the Lake waters, could cause unprecedented blooms of undesirable algae. Phosphates stored in bottom materials now equal the total addition of several years.

As has been indicated, there has been an undesirable and serious reduction in dissolved oxygen levels in Lake Erie. During the past 35 years, the average dissolved oxygen content of the water has decreased from 5 ppm to 2 ppm or less.

Decreases in DO were first noted in 1929. Dissolved oxygen concentrations of 2 ppm or less were noted in some 26,000 square miles, about 1/4 of the total Lake area. In the deeper waters of the eastern portion of the Lake there has been a steady decrease in the amount of oxygen present in the hypolimnion during late summer. In August 1928, dissolved oxygen was 78 percent of saturation in the hypolimnion, whereas in August 1960 it was only 25 percent of saturation. The oxygen deficit in Lake Erie has increased 2.6 times between 1933 and 1955. It has been calculated that the oxygen deficit of the hypolimnion is 270 million pounds.

Concomitant with these environmental changes there have been changes in the fish population. Trout, whitefish, cisco or herring, sauger, walleye, and blue pike have greatly decreased in abundance or have practically disappeared. The normal commercial catch of whitefish, cisco, blue pike, and sauger when compared with the 1960 catch, shows a reduction of 99.92 percent. The catch of walleyes for 1936 when compared to the catch for 1960 shows a reduction of 99.96 percent. There have been further decreases since 1960 in some species. With the decrease in the more desirable species, carp, shad, alewives, smelts and goldfish have increased in number. The environment has become less favorable for the desired species and more favorable for the coarser species, with the result that the latter have greatly increased in numbers at the expense of the desirable species.

It is not necessary to kill fish directly through toxic action in order to decimate or wipe out a species. When environmental conditions become unfavorable for a species, that species can be eliminated through competition for food and space with those species favored by the new environment. This can be illustrated by the experience of a Canadian fisheries investigator. He was carrying out long-term studies for the determination of the oxygen requirements of brook trout. Since he was holding the trout for long periods, it was necessary to provide food for them which he did through the use of minnows. After the experiment had been underway for a considerable time, he noted that the trout seemed to be starving to death. An examination revealed that at the low dissolved oxygen levels in the test aquaria the minnows could swim faster than the trout and the latter just could not catch the minnows. The experimenter solved this problem by simply cutting off the tails of the minnows, but we cannot do anything like this in nature.

Low dissolved oxygen levels when coupled with high temperatures can result in decimation or rapid elimination of a species. Since more dissolved oxygen is required at the higher temperatures for normal metabolism and the water holds less oxygen as the temperature rises, DO and temperature cannot be considered alone; they must be considered together. Furthermore it is not necessary for one species to eat another in order to eliminate it. Some have asked, "How did the carp drive out the bass or some other species?" It is simply competition for food and space and perhaps the muddying of the waters through the rooting activities of the carp. This same problem applies in agriculture. If you had a 10-acre plot and placed 10 cows in it they might do quite well. However, if you were to add 100 goats, the cows would do very poorly and might be greatly reduced in numbers, but the goats wouldn't eat a single cow.

If dissolved oxygen and other environmental conditions are favorable to at least some species, raising the temperature of the water may result in an increase in the total pounds of fish produced due to the increased growth of the coarse species. However, our desire is not simply for quantity of fish but for quality. If we are interested only in quantity in our garden, we would forget about the lettuce, carrots, radishes, etc. and grow only weeds because we could produce more pounds per acre if we grew weeds. However, we do not want weeds, we want lettuce. In the same way the general public wants whitefish, trout, cisco, walleye and sauger instead of carp, shad or alewives.

In summing up, there are several statements of fact and conclusions we can make. It is recognized among all aquatic biologists, limnologists, and geologists that lakes change and evolve. Glacial lakes undergo birth, youth, maturity, old age and death. The speed of this change depends on the size and depth of the lake and conditions in the watershed. However, normally these changes are measured on a geological timetable. It has been observed that man's activities through soil erosion, the addition of large amounts of organic materials and other nutrients have speeded up this change. In fact, the addition of immense amounts of these materials in the wastes from our metropolitan areas has speeded up this change or eutrophication until changes even in the Great Lakes can be noted in the life span of a man. This enrichment with the production of undesirable conditions has been especially notable in Lake Erie which is the shallowest and warmest of the Great Lakes. In addition, it receives the residue of the wastes from the upper lakes and the wastes of four larger municipalities.

Notable changes in Lake Erie are as follows: (1) Bacterial contamination has increased and many beaches have been closed; (2) Rooted aquatic vegetation has increased in many areas, interfering with boating, swimming and producing undesirable conditions on beaches; (3) Filamentous algae has increased to such an extent it has caused nuisances in several areas, interfering with boating, swimming, fishing and the aesthetic enjoyment of the Lake; (4) Plankton populations have increased and they are adding to the organic content of the bottom materials, increasing turbidity and lessening aesthetic values; (5) The organic content of bottom materials has increased with an increase in the oxygen demand, a lowering of DO levels and a change in the benthic or bottom biota; (6) Dissolved oxygen has decreased significantly throughout the Lake but especially in the western portion where DO reaches low levels over extensive areas and at certain periods is absent over bottom areas with the destruction of such desirable fish food organisms as mayflies and caddisflies; (7) Anaerobic conditions have occurred in some areas and are being approached over extensive areas; (8) There have been qualitative and quantitative changes in the fish population with a decrease in the more desirable sport and commercial species such as whitefish, cisco, walleye, sauger, and blue pike and an increase in the less desirable species as the gizzard shad, alewives, carp, goldfish and smelt; (9) Recreational uses have been damaged; and (10) Aesthetic values have been reduced. The conclusion which we must reach is that several uses of Lake Erie have been damaged, lessened or destroyed and it is polluted.

Since these conditions exist the next question is - What shall we do about it? I believe the most important thing in the detecting and abating of pollution is the attitude of the people. Until the people recognize the seriousness of the problem and the necessity of treating our wastes in order to preserve our aquatic resources, the problem will not be met in an adequate manner. To many people pollution control and the spending of money for the treatment of wastes is something the other fellow should do. They are all for it until they have to pay for it. Many know little and care less about the treatment of wastes and the protection of our aquatic resources for the coming generations. The need for sewer systems is recognized but when wastes from a single home are mixed with those of others and put in a common pipe and then discharged out of sight to the stream below the town, the homeowner does not feel much responsibility for them. It is considered socially unacceptable to dump your garbage on your neighbor's front lawn, but there is no social stigma attached to the dumping of your town's wastes in his drinking water.

In our large cities, where the population is removed from direct contact with nature, some think milk comes from bottles or cartons and water comes from a tap. Little thought is given to the origin of the water, its safety, and its adequacy for the future. These attitudes must be changed. We must develop a feeling of responsibility for our actions. We must consider not only the direct but also the indirect and long-term effects of our actions. Often the desire for profit leads people either unknowingly or knowingly to commit offenses against their fellow men. For example, when the sulfa drugs were discovered, their sale was controlled but the law did not cover elixirs. An individual in Tennessee decided he would put them on the market in this form and he searched for good solvents. He found one and put the elixir on the market. However, when people were poisoned, it was found that this solvent was ethelene glycol or Prestone. This is merely an example of quite a common approach.

Our population has now exceeded the number whose wastes can be purified by nature. Natural purification in our streams and lakes can no longer handle the problem. In the past, our wastes were handled at little or no cost; now we must begin to pay for the purifying of them. This is one of the many costs of an ever-increasing population. These costs will be significant. Our water supply is limited by rainfall. If we are to have enough water for all our uses, we must use it over and over again. Such reuse requires that each user return the water he has used to the stream or lake in such condition it does not damage, lessen, or destroy another desired use. With the growth in population and water requirements, secondary or so-called complete treatment is now enough.

The problem in Lake Erie is real and urgent. We cannot make it go away by ignoring it. The record of the past is clear. We have seen what has happened in many small inland lakes. Conditions in extensive areas of Lake Erie are on the verge of going anaerobic. If this occurs, the nutrients which have been stored in the bottom material of the Lake in ever-increasing amounts for many years will be released much more rapidly and there will be a sudden increase in the rate of deterioration. In this instance, the old sayings, "A stitch in time saves nine" or "An ounce of prevention is worth a pound of cure" are very applicable. The bottom areas of the Lake must be kept aerobic. The quickest approach is to remove the nutrients from the wastes of the large cities. Economically feasible methods for the reduction of phosphates and nitrates in waste effluents have been developed. There have been studies in detail by workers in Switzerland. Of course, costs will be greater, but we must meet them if we are to preserve the resource. Water is not a luxury; it is a necessity. It is worth whatever we have to pay to get it. In the future we will do just that. In the final analysis, water is worth more than gold; and if you were thirsty enough you would give all your worldly possession for just one swallow.

The preservation of our water resources, for use now and in the future, is essential for our economic and general well-being, for our health and our very existence. We must act now to restore and maintain this great resource for ourselves and the generations yet to come.

CHAIRMAN STEIN: Thank you. (applause)

I know you realize that Dr. Tarzwell, of course, is our Senior Biologist and he is one of our super stars. I think it's generally acknowledged that his is the foremost aquatic biologist in the world today.

Do we have any comments or questions?

DR. WILBAR: I'd like to ask Dr. Tarzwell just one question. This fertilization of our waters in Lake Erie and other places is caused a good deal by the presence of phosphates and some presence of nitrates -- we agree on that --

DR. TARZWELL: And other materials.

DR. WILBAR: -- and other materials. Now, in a so-called "complete" sewage treatment plant, is it not true that the phosphates from detergents and other matter go through the plant. In other words, the complete treatment doesn't take out the phosphates, to any great degree?

DR. TARZWELL: A portion of the phosphates are removed, but much of the total dissolved phosphates are discharged with the effluent of the plant, under the methods that are generally used at the present time.

DR. WILBAR: So if we cut down appreciably on those sewage treatment plants, this is in addition to those that come from agriculture sources which means that some treatment beyond what we not call "complete treatment" is necessary.

DR. TARZWELL: It sure does. Regular treatment will remove some, but if you're going to really meet the problem of increasing population, you're going to have to go beyond so-called "complete treatment," as I see it.

DR. WILBAR: And to what extent is this treatment known and how much does it cost generally?

DR. TARZWELL: The cost figures I'm not prepared to give you, but the scientists who have been working on waste treatment problems and advanced waste water treatment feel that it is economically feasible to remove the phosphates down to quite low levels expressed as parts per million and some, for instance Dr. Wuhrmann in Switzerland feels that he can remove most of the phosphates and the nitrates in two operations and the cost, as I understand it, is not terribly great. Even if the costs are considerable what other alternative do we have?

DR. WILBAR: I agree. I just wanted to bring out this point that you say in the United States there are few treatment plants for removing the phosphates almost entirely.

DR. TARZWELL: They are removing some, but there is still a considerable portion left--and this is in a good form for rapid use biologically, because it's already broken down. The effluents are rich in carbon dioxide, phosphates, nitrates, trace elements and also growth factors.

CHAIRMAN STEIN: We do have Mr. Coulter here, the Chief of our Technical Services Branch. He has been working on these plants for phosphate removal costs. I wonder if you might want to ask him a question, and you might get more particulars.

Mr. Coulter, will you please come up? Dr. Wilbar has asked Dr. Tarzwell about the removal of phosphates with ordinary secondary treatment--the kind of costs we would run into if we were doing it, and the kind of plants for successfully removing phophates in the United States today.

MR. COULTER: I am James Coulter. I am in charge of the Water Projects Section for the Division of Water Supply and Pollution Control, Department of Health, Education, and Welfare.

As I understand the question, Dr. Wilbar, it is, what is the efficiency of phosphate removal, or what could it be in secondary treatment?

DR. WILBAR: Yes. As I understand it, most of the plants today in this country are not doing a very complete job of removing phosphates. Now, methods are available. What are these methods, and what does it cost?

MR. COULTER: First of all, in primary treatment there is very little removal of phosphate. In secondary treatment of sewage--and by secondary, I mean after going through the stages where sewage is treated by physical methods, that is by settling, screening and so on, it is subjected to biological action, phosphate removal varies from about 10 percent to 70 percent. The variation seems to be in the method in which the activated sludge is handled. That is, how the sludge is handled after it is taken from the secondary process.

We believe that it is quite possible to operate a conventional secondary sewage treatment plant in a manner so that about 60 percent of the phosphate will be removed. I'm not sure exactly what the figure is in the report, but it is in the area of 60 percent.

The Chicago-Metropolitan District reports as high as 75 percent removal of phosphates, and it seems to be as a result of pulling the sludge out of the system, and incinerating it, without letting the phosphate return back into the system.

CHAIRMAN STEIN: Do you want to talk about costs? What would be the cost if we have to go to something beyond secondary treatment to get rid of the phosphates, or to put a stage in in addition to traditional secondary treatment which would remove the phosphates?

MR. COULTER: Yes, in the advanced waste treatment studies at the Sanitary Engineering Center the removal of phosphates has been investigated in a number of areas throughout the country. Working on secondary sewage plant effluents it is possible to remove up to about 99 percent of the phosphates by adding a stage of chemical precipitation. That is, coagulating the effluents, settling it, running it through a filter. It is a commonly used sanitary engineering process that is normally used in water treatment rather than sewage treatment. The costs are well known, and it appears that phosphates can be essentially completely removed at a cost of about eight cents per thousand gallons.

CHAIRMAN STEIN: Are there any further questions or comments on either this phosphate removal, or for Dr. Tarzwell?

If not, thank you very much Mr. Coulter and Dr. Tarzwell for an excellent presentation.

MR. POSTON: We will next hear from Mr. Grover Cook, who is Chief of our Regional Enforcement Program. Mr. Cook will, in a brief form, give us a summary of the Part 1, Lake Erie Report. Mr. Cook.

MR. COOK: Mr. Chairman, conferees, ladies and gentlemen, the Report was read more in its entirety in Cleveland. I think many of the conferees heard this. We will only hit the high spots here. I am starting on page 9 of the Report, in case you wish to follow me.

"Lake Currents

"The net movement of water in Lake Erie is from west to east draining into Lake Ontario via the Niagara River...

"More than 90 percent of the input to Lake Erie is from the Detroit River. Most of this flow comes down the center of the River, fanning out continuing far southward into the western basin. The flow along the west side of the River continues along the Michigan shore to mix with the Maumee River discharge. This flow then continues eastward along the Ohio shore. The flow along the east side of the Detroit River moves eastward along the Canadian shore.

"The western basin water mixes in the island area and most of it then drains into the central basin via Pelee Passage. Studies show a dominant flow toward the west in the southern channels creating an essentially rotary movement in the island area.

"The drainage from Pelee Passage appears to reach as far south as the Ohio shore at least at the surface. However, most of the flow turns eastward before reaching that far south.

"The predominant eastward flow in the central and eastern basin is reinforced by prevailing winds from the southwest; however, wind studies for a 10-year period for Lake Erie indicate that the reversed pattern or flow may occur nearly 25 percent of the time.

"Discharges from tributary streams along the south shore such as the Huron, Vermilion, Black and Cuyahoga Rivers, and other streams to the east in Ohio, Pennsylvania, and New York, tend to stay along the south shore and move normally eastward with an alternate, but smaller secondary flow to the west. General dispersal of the flows from the south shore streams with the deeper off-shore waters is limited.

"The discharge of wastes and the tributary streams along the south shore of the lake will increasingly contribute to the pollution of beaches and other water uses as it moves along the shore, both from Ohio waters into Pennsylvania and to a lesser extent from Pennsylvania to Ohio. This along shore flow will also apply to the movement of tributary streams and wastes from Pennsylvania to New York and to a less degree from New York to Pennsylvania.

"Deep water or mid-lake circulation is complex in the central and eastern basins being controlled to a great degree by the wind. The wind induces surface flow in its general direction accompanied by an opposing subsurface flow into the wind. Since south-west winds prevail, the surface flow is dominantly toward the east and the subsurface flow is dominantly toward the west over most of the central and eastern basins. A wide band along the Canadian shore, as wide as about 1/3 of the lake's width, moves predominantly eastward from top to bottom....

"It is apparent from these studies that discharges anywhere along the shores of Lake Erie can affect water quality in Lake Erie, with the dominant effect occuring from west to east.

"IV - DEGRADATION OF LAKE ERIE

"Lake Enrichment

"Eutrophication means enrichment of waters through either man-created or natural means. Natural enrichment produces a rate of lake aging that may be manifested only on the clock of geologic time. Additional fertilization will accelerate the rate of lake aging, making changes in water quality noticeable within a decade or even less. For example, growing cities and expanding industries are pouring nutrients into the nation's waterways at an ever-increasing rate, and aquatic weed and algal nuisances are occuring in areas where they did not exist before.

"The scope of accelerated eutrophication or water enrichment is broad and the ramifications are many. The most perceptible characteristics to the layman include nuisance growths of small suspended plants or algal scums, developing areas of rooted water plants, and odors associated with decaying dead vegetation and possibly fish. More subtle changes can be found by the investigator as indicated by decreased light penetration; decreased dissolved oxygen in deeper waters; increased nitrogen and phosphorus concentrations especially in the deeper waters; significant changes in the algal population, and in the kinds and numbers of bottom dwelling organisms, and increased rooted aquatic weed beds.

"There are many elements that are essential to life processes. Among these are carbon, hydrogen, oxygen, nitrogen, phosphorus, potassium, sulfur, and several trace minerals. They are all present in sewage. Nitrogen and phosphorus is partially removed by a sewage treatment plant, but the percentage of removal depends on plant design and efficiency of operation. Nitrogen is in good supply from natural sources (80% of the air we breathe is nitrogen), but phosphorus is not plentiful. The density of algae growth is usually governed by the concentration of phosphorus. If phosphates are reduced, algae growths are correspondingly less. Phosphorus, a constituent of domestic sewage and certain industrial wastes, promotes algae growths and is thus a serious pollutant that must be controlled.

"It is well documented that many lakes throughout the country have been fertile reservoirs for algal development for many years and have been labeled eutrophic."

CHAIRMAN STEIN: Just a moment. I think the record should show that the alternate for Pennsylvania, Mr. Richard Boardman is here, instead of Dr. Charles Wilbar at this point.

Will you go on?

MR. COOK: "Included among these are Lake Zoar in Connecticut, Lake Sebasticook in Maine, the Madison lakes in Wisconsin, Lake Erie, the Detroit lakes in Minnesota, Green Lake and Lake Washington in Washington, and Klamath Lake in Oregon. Of these, Lake Erie is the largest.

"When the concentrations of inorganic nitrogen and soluble phosphate exceed 0.3 mg/l and 0.03 mg/l, respectively, prior to the algal growing season and when other growth conditions such as light, temperature, and turbulence are favorable, algal blooms have been found to develop. Those algae that occur usually in small numbers in infertile lakes become supplanted by larger populations of more troublesome kinds.

"As nutrient concentrations increase, the numbers of algal cells increase. Nuisance conditions such as surface scums and algal-littered beaches occur. The water may become foul-smelling. Filter-clogging problems may occur at municipal water supplies. Filamentous algae, especially Cladophora, grow profusely on almost any suitable subsurface. They, too, cause nuisance conditions when they break loose and wash ashore at bathing beaches to form windrows of stinking vegetation. Growths of filamentous algae and slimes hamper commercial fishing by adhering to nets, and interfere with municipal and industrial water supplies by clogging intake screens.

"At this stage of eutrophication other changes are occurring in the lake. The bottom is changed by sedimentation of organic material; this habitat is changed from one suitable for mayfly nymphs, scuds and other small organisms favored as food by desirable fish to one where only sludgeworms and bloodworms can exist. Fish populations are changed to the coarser species because the habitat is more favorable to them.

"Nutrient concentrations in Lake Erie indicate that soluble phosphate values in the western basin consistently exceeded the stated critical value during studies in 1963 and 1964, with average concentrations ranging from 0.05 to 0.15 mg/l phosphate (PO_4). The central and eastern basins now have phosphate concentrations at the critical threshold value and any increase in present levels will produce a corresponding increase in algal populations."

I would like to depart from the text for just one moment. This past weekend I observed a bloom which apparently was a blue-green algal bloom, just west of Cleveland, well out in the Lake. As far as I know, this has never been reported in this area before. That is a pretty discouraging sight to a limnologist.

"Water clarity as demonstrated by Secchi disc readings indicates that visibility of the white and black disc extends through 4 feet in the western basin, and through 13 feet in both the central and eastern basins. Because this test measures relative turbidity conditions by a combination of algae and other suspended material, it reflects undesirable changes in the western basin.

"The biology of the western Lake Erie basin has changed drastically during the past 35 years, especially the past 15. In the Bass Island area, samples collected in September 1964, showed suspended algal populations of 3,500 organisms per milliliter (about 3.5 million per quart) compared to a maximum 1,000 per milliliter found in a study conducted between 1938 and 1942. Species composition has also changed from one predominantly of diatoms to one presently dominated by blue-green algae that are associated closely with enriched waters.

"Long-term increases in suspended algal populations are also apparent from data published for the area adjacent to Cleveland in the central basin of Lake Erie. Annual averages have increased from 200 to 400 cells per milliliter between 1920 and 1930 to 1500 to 2300 cells at the present time. Also, there have been significant changes in dominant organisms with blue-green algal forms becoming increasingly present even in this area.

"Although historical data are not available for the suspended algae of the eastern basin, PHS studies in 1963 and 1964 revealed that the kinds and numbers are similar to those that occurred in the central basin.

"The filamentous green alga Cladophora is encouraged by enriched waters to grow on any suitable attachment site. When it matures, it characteristically breaks loose, floats to the water surface, and creates an odorous nuisance when deposited on beaches by wind and waves. An estimated 340 miles of Lake Erie shoreline has a subsurface suitable for Cladophora growth. Nuisance conditions have become so severe that restricted swimming and sunbathing have occurred in the island area and at the beaches in the eastern basin, especially east of Erie, Pennsylvania and near Dunkirk, New York.

"Dissolved Oxygen Deficit in the Bottom Waters

"Low dissolved oxygen concentrations were detected in the bottom waters of the central basin as early as August 1929 when DO values of 4.4 and 4.8 mg/l were recorded at 2 stations in the central basin. A low value of 0.8 mg/l was measured at one station near Marblehead, Ohio, in August 1930.

"Low DO values from 1948 through 1951 of 2 to 4 mg/l were recorded and in September 1959 the DO was found to be less than 3 mg/l in a large area of the central basin. A survey in August 1960 revealed a similarly large area where the DO was less than 3 mg/l. One zero DO was recorded in August 1959 near the south shore.

"In August 1964, an area of about the same magnitude was found where the DO concentrations were even lower. Most of the affected area had DO values of 2 mg/l or less. This area was about 2,600 square miles, or about 25 per cent of the entire lake.

"In summary, dissolved oxygen values in the bottom waters of the central basin of Lake Erie appear to have decreased during the past 35 years from about 5 mg/l to less than 2 mg/l with many parts near zero.

"This DO deficit is caused largely by lake enrichment.

When this is coupled with a physical phenomenon called thermal stratification, the mechanism is established through which oxygen is consumed in the bottom waters. As explained earlier, the lake is enriched by the introduction of such materials as nitrogen and phosphorus that encourage plant growth. Thermal stratification occurs when the upper layer of lake water becomes one temperature, a lower layer of water becomes a different temperature, and a third layer of water called the thermocline is sandwiched between them. The thermocline is the layer where a sharp temperature differential exists.

"During summer stratification, the upper water layer is as much as 16°C higher than the bottom layer. Almost all lakes stratify thermally, but dissolved oxygen deficits occur only in those lakes where large amounts of oxygen-consuming materials and nutrients have been introduced. These materials may be introduced directly as sewage or certain industrial wastes, or indirectly by nutrients that accelerate algal growth. Suspended organic materials are scattered over a wide area by winds and lake currents, settle to the bottom, and exert an oxygen demand during decay. The crop of suspended algae that grow in great numbers in a fertile lake is ever changing. Cells die off and settle slowly to the bottom. During their descent, they are attacked by decay organisms and exert an oxygen demand. Thus, in a fertile lake, oxygen is being removed by the bottom muds and by the suspended organic matter in the water above. Lake Erie is susceptible to damage from these happenings, especially in its central basin.

"The western basin does not become stratified except during 6 to 7 day periods of calm because it is so shallow that wind-induced turbulence creates thorough mixing from surface to bottom."

"Both the central and eastern basins do become stratified, usually from June to October. A serious dissolved oxygen deficit does not develop in the eastern basin because it is much deeper than the central basin. The thermocline, or middle layer of water, lowers in the central basin as stratification becomes well established until it is about 50 feet below the surface. At this time, the lower layer of water in the central basin becomes thin, on the order of 8 to 10 feet thick. At the same time, the eastern basin, which is about 150 feet deep, may have a bottom layer 100 feet thick.

"The central basin is adjacent to the western basin where there are large inputs of wastes and where the heaviest growths of suspended algae occur. The overall easterly movement of water may carry some of this material to the quieter waters of the central basin where it settles to the bottom..."

As stated previously, inputs of phosphates are primarily responsible for the biological problems of Lake Erie.

"Phosphorus, in its inorganic form of orthophosphate (PO_4) is an essential element of biological life. It is used extensively as an agricultural fertilizer. All animals and plants require phosphate for normal growth and reproduction.

"Because phosphate is so important to biological life it can become a controlling factor in the rate of growth or size of crop, and under conditions of limited abundance as prevails in Lake Erie it is the one factor most easily controlled.

"The pollution caused by phosphate in Lake Erie results in uncontrollable production of algae followed by decay of this organic matter produced in the Lake. The decay, in turn produces zones of oxygen depletion, as has been evidenced by studies in the past and the recently revealed zone of serious oxygen depletion of 2600 square miles of the central basin. The productivity and decay that caused this tremendous loss of oxygen was of massive proportions. In 1964 it produced an oxygen deficit estimated at 270,000,000 pounds. The total of all oxygen consuming wastes from man-made sources now entering the lake is only a small portion of the oxygen demand causing this deficit.

"Phosphate inputs from principal sources are presented in Table 8," which I am going to read. We didn't do this at the first conference at Cleveland, but I think it is illuminating. It's the last table in the report, page 50. It is entitled "Soluble Phosphate Inputs to Lake Erie." If you will follow on the map from west to east, you may get a better vision of what's being introduced in the way of phosphates.

"TABLE V-8
SOLUBLE PHOSPHATE INPUTS TO LAKE ERIE

Source	Pounds/Day
MICHIGAN	
Discharge from Lake Huron	11,800
Municipal	70,000
Industrial	10,000
Tributaries	
Huron River	2,000
Raisin River	900
OHIO	
Municipalities	
Toledo	8,400
Sandusky	1,000
Lorain-Avon	2,600
Lakewood	1,100
Cleveland Westerly	5,400
Cleveland Easterly	14,900
Euclid	2,100
Industrial--Direct Discharge	unknown
Tributaries	
Maumee River	11,000
Portage River	1,100
Sandusky River	6,000

Source	Pounds/Day
Black River	3,100
Rocky River	3,400
Cuyahoga River	3,500
Chagrin River	300
Grand River	---
Ashtabula River	100
PENNSYLVANIA	
Erie	2,600
Other Sources	2,900
NEW YORK	
Buffalo River	2,300
Other Sources	2,500
CANADA (est.-Municipal)	5,000
Sum of Major Known Sources	174,000
Discharged at Niagara River	24,000

"Of the total of 174,000 pounds of soluble phosphate discharged from known sources daily, 67 per cent is from municipal and industrial sources discharging directly to the Lake, and 33 per cent from tributaries (including the St. Clair River), and other small sources. The St. Clair River input is 6.8 per cent of this total. All other sources are amenable to some degree of control.

"A 65 per cent reduction of phosphate inputs can be achieved through secondary sewage treatment, operated to effect optimum phosphate removal. Secondary treatment provides additional benefits through greater reduction of oxidizable organic matter, disease-causing organisms, phenolics, nitrogen, and other waste materials.

"The major controllable sources and the amount of reduction that can be achieved by the secondary treatment described above are listed below:

Detroit	45,500 pounds per day
Toledo	2,900
Sandusky	700
Lorain-Avon	1,700
Lakewood	600
Westerly	3,500
Easterly	6,800
Euclid	1,300
Erie	1,300
	64,300"

If the one large Michigan source were reduced 80 percent, this would give us another 8,000 pounds per day reduction, for a grand total of 72,300 pounds per day reduction.

"Thus, at least 40 per cent of present PO_4 input can be reduced by secondary treatment at the principal waste sources. This alone would significantly reduce algae growths in the Lake. Therefore, the first requirement for phosphate pollution control in Lake Erie is the construction of secondary treatment plants where they do not now exist and improved treatment techniques for those plants that now practice secondary treatment.

"These reductions, based on present day factors, must be constantly improved in order to account for increases in phosphate loadings resulting from population, industrial and agricultural growth.

"Even with the institution of secondary treatment, and operation of treatment plants for optimum phosphate removal, the reduction in phosphate inputs will require several years, and no sudden or dramatic reductions in Lake algal productivity can be expected. Therefore, top priority must be given to the earliest construction and operation of those plants at which the highest removals can be achieved; namely Detroit, Toledo, Cleveland, and Erie. After these treatment practices are in operation it can be reasonably expected that significant improvement in the water quality in Lake Erie will be observable within a few years. At that time, the effects of these measures should be reevaluated to determine if further reduction of nutrients by additional treatment will be necessary."

Mr. Stephen Megregian will present Part 3 of the report, covering Pennsylvania and New York.

CHAIRMAN STEIN: We will call for questions and comments on this after Mr. Megregian has read his report if that is agreeable. All right, Mr. Megregian.

MR. MEGREGIAN: Chairman Stein, conferees, ladies and gentlemen, I am Stephen Megregian, the Deputy Project Director of the Great Lakes Illinois River Basins Project.

Mr. Cook has presented Part 1. Part 2 was presented in Cleveland which covered the Michigan, Indiana and Ohio portions of the basin, and I will now present Part 3, which covers the Pennsylvania and New York portion of the Lake Erie Basin, Part 3 of the Federal Report.

CHAIRMAN STEIN: You're going to summarize this, aren't you, Mr. Megregian?

MR. MEGREGIAN: I will eliminate certain portions of the report. I will indicate the pages as I go along.

CHAIRMAN STEIN: We can put this whole thing in the record, as read. How long will this take - about a half hour?

MR. MEGREGIAN: It shouldn't take me more than a half-hour - probably a lot less.

CHAIRMAN STEIN: O.K.

MR. MEGREGIAN: Part 3, Chapter 2, Pennsylvania. I will begin by reading "Sources of Wastes," page 106.

"The principal sources of pollution in the basin are municipal sewage from treatment plant effluents, combined sewer overflows, and industrial wastes. Other wastes, discharged intermittently, also have severe, though temporary effects. Among these are accidental spills from vessels or industries, and wastes from lake vessels.

"The major sources of municipal wastes are Erie, Girard, Lake City, and North East. All major treatment plants in this basin provide secondary treatment and remove an average of 85 per cent of the BOD. North East and Erie chlorinate their sewage treatment plant effluents. Lake City and Girard are enlarging their treatment plants and plan to include chlorination, as required by the State of Pennsylvania.

"Bacterial tests of Mill Creek and Garrison Run indicate that they are receiving domestic wastes. Samples collected in the harbor off Mill Creek in 1964 revealed high coliform bacterial counts.

"Lake City and North East have separate sewers for domestic wastes and stormwater runoff. Girard has a combination of separate and combined systems. Erie is served by a combined system, mainly in the downtown area.

"Industrial Wastes

"One industry, Hammermill Paper Company, contributes 90 percent of the total oxygen demand loading to this area's water." This demand is about 120,000 pounds per day of BOD. "This part of Hammermill's waste will soon be largely removed with the installation of deep well disposal. However, this will not alleviate the problem caused by the discharge of tannins and lignins from spent pulping liquors. These wastes cause the water to foam, turn brownish black in appearance, and produce a strong odor.

"Other industries having discharges with a more localized effect are Gunnison Brothers, Interlake Iron Corporation, General Electric, and Parker-White Metal. Noticeable quantities of oil and iron have been observed on Fourmile Creek.

"Effects of Wastes on Water Quality and Water Uses

"Various communities along the lakefront have individual pollution problems. Beaches to the west of Presque

Isle have maintained good quality, while those to the east, including Beach 11 on Presque Isle, have at times been severely polluted. The pollution problems at the beaches have been both bacterial and esthetic.

"Fish kills have occurred sporadically in the history of the lakeshore area and the various tributaries. Many of the fish kills were caused by industrial waste discharges. A combined effort by State and local officials and wildlife organizations has helped to curb illegal industrial discharges.

"As Erie Harbor is enclosed by Presque Isle and has only a small opening into Lake Erie, flow in and out is restricted. Water color in the harbor and along the east shore is a deep brownish-tan, caused by pulp and paper wastes. Turbidity is relatively low in the harbor. Filamentous green algae (Cladophora) is present in most areas of the harbor where the depth is less than six feet. Bottom deposits in the harbor are a brownish black combination of mud, silt and detritus (including wood fiber).

"The waters of Erie Harbor near downtown marina facilities and docks, and off Mill Creek, had high coliform bacteria densities. They ranged from 1,000 to 500,000 organisms per 100 ml near Mill Creek and in the ship channel. The source of this pollution is probably Mill Creek, where coliform densities of over 1,000,000 organisms per 100 ml occurred and from other local sources of pollution. Enteric pathogens of the

Salmonella group were isolated from 80 per cent of the samples collected in both Mill Creek and the Harbor. This same organism was found in Erie's sewage.

"The Hammermill Paper Company's waste outfall is located just east of the mouth of Erie Harbor. With the prevailing winds in the area from the west, Hammermill's effluent affects the water quality and esthetic appearance of beaches and boating areas for 10 to 20 miles eastward. This line of foam and foul smelling colored water is normally visible at Sixteenmile and Twentymile Creeks, and hinders the development of the eastern portion of the basin as a water supply source and as a recreational area. It also reduces the usefulness and value of lakefront property. When the wind is from the east, these wastes make parts or all of the beaches on Presque Isle unusable for water contact sports.

"In addition to their adverse esthetic effects, these discharges cause severe problems with tastes and odors in domestic water supplies which require costly additional treatment. In the spring of 1964, for a period of 5 to 10 days, when the wind was from the east, the City of Erie had high tannin concentrations in its water intakes. Periodically, Erie is forced to close its eastern intake to avoid such high tannin concentrations.

"In the summer of 1964, the Erie County Health Department carried out an intensive microbiological examination of the beaches at Presque Isle State Park. Presque Isle State Park officials, the U. S. Public Health Service, the Pennsylvania Department of Health, and the City of Erie cooperated in this study. A summary of the data collected in the summer of 1964 from over 4,000 separate tests appears below:

"MICROBIOLOGICAL RESULTS FROM PRESQUE ISLE STATE PARK
SUMMER 1964

Beach	Total Coliform Density* Median	Total Coliform Density* % Greater Than 1,000	Fecal Streptococcus Density* Median
Presque Isle - 1	36	4%	10
Presque Isle - 8	23	0%	7
Presque Isle - 10	20	0%	4
Presque Isle - 11	700	38%	5

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* Count per 100 ml - preliminary evaluation, 1964 data, Millipore Filter Technique.

"The data in the above table indicate that Beach 1 on the west end of the park has a source of occasional pollution which diminishes as it progresses along the beach, whereas Beach 11 on the eastern tip is affected by larger and more consistent sources of pollution.

"Preliminary analyses indicate that, except for short periods, all of the beaches except Beach 11 are relatively free from pollution. Beach 11 was closed as a precautionary measure several times this past summer by Park officials while all western beaches remained open at all times."

I won't read the recommended actions until later.

Part III, Western New York, beginning on page 112 - Principal Sources of Wastes.

"Excluding the summer population at two state parks, two cities provide secondary treatment for the wastes from 12,300 people. There are 20,500 people served by three primary treatment plants. Eighteen thousand people are not served by municipal sewerage systems."

Eleven industries discharge wastes to the area's waters. Welch Grape Juice Co., Inc., discharges pressing and process wastes and storage tank wash waters at Brocton and Westfield. Seneca Westfield Main, Inc. and Growers Cooperative Grape Juice Co. discharge similar wastes in Westfield. In Dunkirk, Niagara-Mohawk Power Corporation discharges heat and flyash; Twin Cities Asphalt Company discharges solids; Great Lakes Color Printing Company discharges ink and cleaning solutions.

"Effects of Wastes on Water Quality and Water Uses

"Grape juice processing wastes discharged by four firms in Brocton cause problems of appearance, odor, and oxygen depletion in their receiving waters. Brocton also discharges raw and partially treated domestic sewage to Slippery Rock Creek.

"The main pollution problem at Dunkirk is that of flyash from the Niagara-Mohawk power plant. The flyash is dumped as land fill behind the plant but is washed into the harbor during rains. In sections of the harbor, flyash deposits were as much as two feet deep.

"Dunkirk harbor has problems with algae, especially Cladophora. Storms break them loose and they are washed onto the beaches of the area where they decompose, producing a foul odor. Dunkirk's harbor is shallow and rooted aquatic weeds and algae grow abundantly, making boating almost impossible. Cladophora growths are heavy outside the breakwater.

"A heavy black slick occurs below Great Lakes Color Printing Company. Brown discoloration and suspended solids are found near the Twin Cities Asphalt Company discharge.

"In the summer of 1964, the City of Dunkirk conducted an extensive study of its two major bathing areas. Total coliform densities ranged from 8 to 500,000 organisms per 100 ml. The mean coliform density exceeded the recreational objectives of 1,000 organisms per 100 ml for 34 per cent (Point Gratiot) and 49 per cent (Wright Park) of the time sampled. The beaches are now closed for one to ten days after rainfall or strong winds.

"Silver Creek

"Walnut Creek and Silver Creek are polluted by raw sewage discharged from Forestville and Silver Creek and by wastes discharged by the Silver Creek Preserving Company. This pollution renders the area unsuitable for any water contact sports."

Chapter IV, Erie-Niagara: Begin on page 117, Principal Sources of Wastes - that's page 118 in your book.

"Raw or inadequately treated wastes discharged by industries and municipalities are the principal sources of pollution in this area. Other wastes, which have serious effects, are accidental spills from vessels or industries, land runoff, and wastes from lake vessels.

"The estimated total municipal discharge for the Erie-Niagara basin is between 900,000 and 1,000,000 population equivalent (PE). This represents a net reduction in BOD by treatment of only 37 per cent. Individual cities vary from Attica (90%), Arcade (90%), and Orchard Park (87%) to Buffalo (22%), and Tonawanda Twp. (12%) removal. Improved treatment and collection facilities are needed in many areas.

"Cities in the Erie-Niagara Basin have relatively long histories. Many cities were founded in the early 1800's, and have inherited the antiquated combined sewer systems of early days. Quantities of sewage and industrial wastes are discharged to the waterways whenever excess storm runoff occurs. There are over 30 overflows on the Buffalo River alone. There are areas such as Gowanda and others which continually discharge untreated sewage. Corrective action is needed to remove these sources of pollution.

"Industrial Wastes

"There are two significant sources of industrial pollution in the Cattaraugus Creek drainage basin. These industries are the Peter Cooper Corporation and the Moench Tanning Company. Each discharges wastes having a high oxygen demand and considerable quantities of suspended solids. The industrial waste data (1960) for these industries are summarized below:

"Cattaraugus Creek - Industrial Waste Data

	Flow	BOD		Suspended Solids
	mgd	lbs/day	P.E.	lbs/day
Peter Cooper Corp.	3.59	25,800	155,000	9,580
Moench Tanning Co.	1.67	8,730	52,400	7,600
Total	5.26	34,530	207,400	17,180

"The estimated population in the Cattaraugus Creek drainage basin is 36,000 people; these two industries discharge wastes equivalent in oxygen demand to more than five times this number.

"Smokes Creek flows through the City of Lackawanna and the Bethlehem Steel Company property before it empties into the Lake. An indeterminate but large amount of industrial waste is discharged to the Creek by Bethlehem before it enters the Lake." These wastes are composed of acid, ammonia, BOD, cyanides, iron, oil, phenols, sewage and solids. "Bethlehem Steel Company also discharges wastes to the Lakeshore and the harbor areas. Bethlehem Steel is one of the major sources of pollution in the Smokes Creek area, but detailed data concerning its discharges have not been made available by the State.

"There are five major industries on the Buffalo River. They use the Buffalo River as a source of water supply and also for waste transport. The section of the river where these industries are located is grossly polluted. The type of wastes discharged by each industry is tabulated below:

"Buffalo River - Industrial Waste Discharges

Industry	Type
National Aniline	Synthetic Dyes
Socony Vacuum Oil Co.	Oil, phenolics, cyanides
Donner-Hanna Coke Co.	Phenolics, cyanide, Ammonium, oil, Solids, and BOD
Republic Steel Corp.	Phenolics, cyanide, oil, and solids
General Chemical	Inorganic

"Details of quantity and types of waste discharged by each firm have not been made available. These five industries have jointly formed a corporation with the specific purpose of obtaining a suitable water supply. A multi-million dollar project is presently under construction to obtain a water supply from Lake Erie. The project will have a capacity of about 200 mgd and will be used primarily to furnish cooling water. The industries propose to use this water on a once through basis, returning it directly to the River. This increased flow will flush wastes from the Buffalo River into Lake Erie, but it will not in itself reduce the input of wastes to the Lake.

"Sedimentation is a problem in several areas in the Basin. High sediment loads are related to heavy rainfalls or snow melts, and last for only short periods of time. The average annual sediment load for all areas except the upper Buffalo and Tonawanda areas ranges from 100 to 1,500 tons per year per square mile.

"Over 100,000 tons of sediment must be dredged from the Buffalo River yearly to keep its navigation channel open. Data indicate that some of this sediment originates from industrial wastes discharged in the river.

"Effects of Wastes on Water Quality and Water Uses

"Waste discharges in the Erie-Niagara Basin affect the immediate receiving stream, the shoreline, and the eastern side of the Niagara River.

"In the summer of 1964, an extensive microbiological study of the major public beaches was conducted by the Erie County Department of Health. Beaches were examined from Evangola State Park on the west to Beaver Island State Park on the east. It was found that in most cases there was a direct correlation between rainfall and high or gusty winds and coliform densities. Several of these beaches are now automatically closed to the public after rainfall and/or high winds, for one to three days. The beaches were affected by nearby streams carrying wastes, by sewage treatment plant discharges, and by combined sewer system overflows.

"Cattaraugus Creek

"Raw domestic sewage, toxic wastes, oil, organic loadings are poured into Cattaraugus Creek in the vicinity of

Gowanda by Peter Cooper Corp., Moench Tanning Co., and the Village of Gowanda. Dumps are located along the creek banks. Above these outfalls the stream is clear; below them the stream becomes a virtual cesspool during low flow months. Damage to fish and wildlife and recreation by pollution occurs in that part of the basin below the outfalls.

"Eighteenmile Creek is relatively free from pollution except in the vicinity of Hamburg, while Big Sister Creek has been grossly polluted and was only 30 per cent sewered. With the recent construction of two new sewage treatment plants in the area, water quality in Big Sister Creek should improve. Both of these streams have a potential as fish and recreation areas.

"Buffalo River System

"The Buffalo River Basin is composed of the Buffalo River and its tributaries of Cazenovia Creek, Cuyuga Creek, and Buffalo Creek.

"Under prevalent conditions of sluggish flow, the lower Buffalo River resembles a vast septic tank, with no dissolved oxygen and high biochemical oxygen demand during critical periods, and with oil, color and exotic waste materials. Following heavy rainfall combined sewer overflows and bottom scourings threaten the quality of the water supplies of the City of Buffalo and other municipalities. The Buffalo River is too grossly polluted to support fish, bottom dwelling animals, or attached algae.

"Except for high coliform densities, the water in Cayuga Creek above Lancaster and Depew is good in quality. At low flow, Cayuga Creek becomes septic below the Depew Sewage Treatment Plant. Oil discharges have been noted in the lower seven miles of the Creek.

"The West Branch of Cazenovia Creek is of good sanitary quality; so is the East Branch except for its last two miles which have a high BOD loading from the East Aurora Sewage Treatment Plant. Cazenovia Creek's water quality remains relatively high until the stream reaches West Seneca. The stream supports a well-balanced population of bottom dwelling animals which include many pollution-sensitive forms.

"Pollution from sewer discharges in the lower six miles of the stream degrade the water quality until, near the mouth, the DO at times becomes zero."

Mr. Cook will read the recommended actions that were presented in Part 1, and I will complete it.

MR. COOK: This is page 1 of part 1 of the report.

CHAIRMAN STEIN: Mr. Cook, in the interests of saving time, we will leave out Part 1 of the report - I read that this morning, as ratified by the conferees. I wonder if we could just do the specialized portion, because in view of the Cleveland session, that might be a little out of date.

All right, I think we can move down from that.

MR. MEGREGIAN: Recommended actions for the Pennsylvania area.

"The recommendations for pollution abatement set forth in Chapter I, Part 1 are to be adopted where applicable in the Pennsylvania Basin. In addition, it is recommended that the following specific actions be taken:

"1. The Erie metropolitan area develop a plan which will outline the steps to be taken to provide solutions to pollution created by combined sewer overflows.

"2. The following industrial plants take the necessary actions listed:

Industry	Necessary Action
Hammermill Paper Company	Reduction of Solids and Spent Cook Liquors
Interlake Iron Company	Reduction of Phenols and Solids
Electric Materials Co.	Reduction of Heavy Metals
Erie Brewing Co.	Reduction of BOD
Erie Reduction Co.	Reduction of BOD
Kaiser Aluminum Co.	Reduction of Heavy Metals."

For the Western New York Basin, recommended actions.

"The recommendations for pollution abatement set forth in Chapter I, Part 1, are to be adopted where applicable in the Western New York Basin. In addition, it is recommended that the following specific actions be taken:

"1. The following industrial plants take the necessary actions listed:

Industry		Necessary Action
Niagara Mohawk Power Company	-	Keep flyash out of Lake
Silver Creek Preserving Company	-	BOD reduction
Welch Grape Juice Company, Inc.	-	BOD reduction
Seneca Westfield Maid, Inc.	-	BOD reduction
Growers Cooperative Grape Juice Co.	-	BOD reduction"

For the Erie-Niagara Area, the recommended actions are as follows:

"The recommendations for pollution abatement set forth in Chapter I, Part 1 are to be adopted where applicable in the Erie-Niagara Basin. In addition, it is recommended that the following specific actions be taken:

"1. The Buffalo metropolitan area develop a plan which will outline the steps to be taken to provide solutions to water pollution created by combined sewer overflows.

"2. Necessary action be taken to eliminate oil and debris in the Lake, tributaries, and harbor waters.

"3. The following industries provide waste treatment or reduction of waste at its source to eliminate water pollution: Allied Chemical and Dye Corporation, General Chemical Division; Allied Chemical & Dye Corp., National Aniline Division;

Bethlehem Steel Co.; Donner-Hanna Coke Corporation; Hanna Furnace Corporation; Moench Tanning Co.; Penn-Dixie Cement Co.; Peter Cooper Corp.; Republic Steel Corp.; Socony-Vacuum Oil Company; Union Plating Works."

Thank you.

CHAIRMAN STEIN: Thank you. Are there any comments or questions?

If there are a considerable number of questions, we'd better wait for the morning. Most of you plan to be here tomorrow, don't you?

We will stand recessed until 9:30 tomorrow morning, same place.

(CONFERENCE RECESSED AT 4:15 P.M.)

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